

Single versus Multiple Suicide Attempts: A Prospective Examination of Psychiatric
Factors and Wish to Die/Wish to Live Index

by

Kristen M. Kochanski

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Dissertation Advisor: Marjan G. Holloway, Ph.D.

Dissertation Chair: David Krantz, Ph.D.

Dissertation Members: Mark Ettenhofer, Ph.D., Eric Getka, Ph.D.



UNIFORMED SERVICES UNIVERSITY, SCHOOL OF MEDICINE GRADUATE PROGRAMS
Graduate Education Office (A 1045), 4301 Jones Bridge Road, Bethesda, MD 20814



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Name of Candidate: Kristen Kochanski
Doctor of Philosophy Degree
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DISSERTATION AND ABSTRACT APPROVED:

DATE:

5-3-2013

Dr. David Krantz

DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Committee Chairperson

Marjan G. Holloway, Ph.D.

5-3-2013

Dr. Marjan Holloway

DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Dissertation Advisor

5-3-2013

Dr. Mark Ettenhofer

DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Committee Member

✓ 5-3-13

Dr. Eric Getka

WALTER REED NATIONAL MILITARY MEDICAL CENTER
Committee Member

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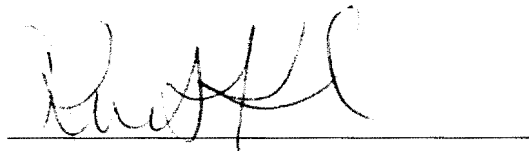
Finally, to my wife, Aimee, for being my motivation for everything I do.

DEDICATION

This dissertation is dedicated to all individuals who have struggled with the wish to die versus the wish to live and the family members who help them.

Copyright Statement

The author hereby certifies that the use of any copyrighted material in the dissertation manuscript entitled: Single versus Multiple Suicide Attempts: A Prospective Examination of Psychiatric Factors and Wish to Die/Wish to Live Index is appropriately acknowledged and, beyond brief excerpts, is with the permission of the copyright owner.

A handwritten signature in black ink, appearing to read 'Kristen Kochanski', is written over a horizontal line.

Kristen Kochanski

Abstract

Title of Dissertation: Single versus Multiple Suicide Attempts: A Prospective Examination of Psychiatric Factors and Wish to Die/Wish to Live Index

Author: Kristen M. Kochanski, M.S., 2012

Directed by: Marjan Ghahramanlou-Holloway, Ph.D.
Associate Professor
Department of Medical and Clinical Psychology

Background: Suicide continues to be a major public health concern within the United States (U.S.) and within the U.S. military. A history of suicide attempt has been identified as a key risk factor for eventual death by suicide. Individuals with multiple suicide attempts present a more severe clinical picture and may be at greater risk for suicide than those with a single attempt. To date, no studies directly attempt to address differences in single versus multiple suicide attempt status individuals within an active duty military sample and a civilian sample, as well as understand how these individuals may differ in symptomatology over time.

Purpose: The goals of this study were threefold: (1) to confirm that individuals with multiple versus a single suicide attempt exhibit a more severe clinical picture; (2) to determine if multiple attempt individuals sustain a more severe clinical picture over time compared to single suicide attempt individuals; and (3) to evaluate potential differences between civilian and military individuals with multiple suicide attempts.

Method: This dissertation study involved secondary analyses of outcome data collected in the context of four psychotherapy trials for the prevention of suicide. Specifically, these studies utilized a randomized clinical trial (RCT) design which involved

longitudinal data collection at various follow-up intervals. Two of the RCTs were based on studies currently underway at the Uniformed Services University of the Health Sciences (USUHS). The remaining two RCTs consisted of studies conducted at the University of Pennsylvania (UPenn). All data from all RCTs was combined to form one dataset. For this study, data collected at baseline, 1-month follow-up, and 3-month follow-up was analyzed. Inclusion criteria differed slightly by RCT, but all participants used in this study had at least one lifetime suicide attempt. A de-identified subset of the data was used for this dissertation study to address the specific objectives outlined above.

Results: Overall, some differences emerged between single and multiple suicide attempt status individuals. Specifically, multiple attempt individuals were more likely to have problem drug use, an indication of borderline personality disorder traits, and more severe psychiatric comorbidity. Multiple attempt individuals also had higher wish to die/wish to live index scores and more severe depression at baseline, while they maintained more stability in high level symptoms over time for suicidal ideation-*worst* and wish to die/wish to live index-*worst*. When comparing military personnel and civilians with multiple suicide attempts, the military personnel were three and half times more likely to have a non-PTSD anxiety disorder and civilians were over three times more likely to have problem alcohol use.

Discussion: The findings from this study have further advanced our understanding of the differences between the individuals who may attempt suicide only once versus those who repeatedly attempt, both in civilian and military samples. Additionally, the findings have important clinical implications and they provide a path for future research so we can better prepare and adapt suicide risk assessment, management, and treatment efforts.

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SINGLE VERSUS MULTIPLE SUICIDE ATTEMPTS

Suicide is a significant public health problem within the United States (U.S.) and remains a critical concern for the Department of Defense (DoD). Nationally in 2010, with a suicide rate of 12.4 per 100,000, an American died every fourteen minutes (McIntosh & Drapeau, 2012). This rate has increased since 2007, bringing suicide from the 11th leading cause of death to the 10th leading cause of death within the country and the 3rd leading cause for those between 15 and 24 years of age (Centers for Disease Control and Prevention [CDC], 2012; McIntosh & Drapeau, 2012). Similar to the national increase in suicide deaths, the U.S. military has also seen increases in suicide deaths. The rate of suicide in 2008 was 15.8 per 100,000 (Ramchand, Acosta, Burns, Jaycox, & Pernin, 2011) and has continued to increase to 18.0 per 100,000 in 2011 (DoD, 2011).

Epidemiological studies have identified a number of demographic, psychosocial, and psychiatric risk factors for suicide. Among these, a history of suicide attempt has been recognized as one of the most robust and clinically meaningful risk factors for death by suicide (Brown, Beck, Steer, & Grisham, 2000). Additionally, there is some evidence to suggest that individuals who make more than one suicide attempt are at even greater risk for dying by suicide compared with individuals who have only one prior suicide attempt (e.g., Weiner, Richmond, Conigliaro, & Wiebe, 2011), possibly due to a more severe clinical picture (e.g., Forman, Berk, Henriques, Brown, & Beck, 2004). Despite the recognition of suicide attempt behavior as an important risk factor for eventual death by suicide, there remains an insufficient understanding about differences in characteristics of those who attempt one time versus those who attempt multiple times.

Such an understanding would provide a solid framework for suicide prevention efforts at the primary, secondary, and tertiary levels.

The overall purpose of this dissertation was to examine psychiatric and wish to die/wish to live (i.e., ambivalence) differences among individuals with single versus multiple suicide attempts. This research expands on previous studies in two ways: (1) by using both cross-sectional and longitudinal data; and (2) by using both civilian and military data. Data for the study was drawn and merged from four randomized controlled trials (RCTs) conducted at two sites (i.e., University of Pennsylvania [UPenn] and Uniformed Services University of the Health Sciences [USUHS]) involving individuals who had recently attempted suicide. Univariate, regression and hierarchical linear modeling (HLM) analyses were used to best characterize the observed statistical and clinically meaningful differences among individuals with single versus multiple attempts.

This dissertation is organized into the following seven sections: (1) Background; (2) Purpose and Significance; (3) Aims and Hypotheses; (4) Methods; (5) Data Analytic Plan; (6) Results; and (7) Discussion. Section I (Background) provides a brief overview of the public health significance of suicide and attempted suicide for both civilian and military populations, followed by a comprehensive review of the literature on suicide behavior recurrence. Section II (Purpose and Significance) highlights the gaps in the existing scientific literature and ways in which this dissertation study addresses these gaps. Section III (Aims and Hypotheses) outlines the objectives and expected findings for the proposed study, as well as rationale for all predictions. Section IV (Methods) provides an overview of the research design, methodology, procedures, measures, and human subjects protection associated with each of the RCTs from which the data for this

dissertation was drawn. Section V (Data Analytic Plan) provides information on the planned data construction strategy. For each study aim and hypothesis, the statistical tests to be performed are outlined along with power analyses which arrive at estimated sample sizes. Section VI (Results) provides additional detail on statistical procedures, as well as details of analytic results based on hypothesis testing associated with each stated aim of this dissertation. Section VII (Discussion) provides a critical review of the study's findings in conjunction with the current scientific literature. In addition, methodological limitations as well as expected scientific contributions are presented along with recommendations for future research and clinical practice.

Section I. Background

Public Health Significance of Suicide Attempts

An American attempts suicide every 32 seconds. A 25:1 ratio for suicide attempt and suicide has been estimated for the U.S. population with the highest disproportion noted for the young (i.e., 100-200:1; CDC, 2012). The lifetime prevalence of suicide attempts is estimated at 2.7% (Nock, Borges, Bromet, & Cha, 2008). The average rate of a subsequent suicide attempt has been reported to be 15-16% at 1-year and 20-25% over the following years (D. Owens, Horrocks, & House, 2002); as many as 1.8% of individuals who attempt suicide die by suicide in the year following their attempt (D. Owens et al., 2002).

Meta-analytic findings based on standardized mortality ratios from nine studies indicate that individuals who attempt suicide are 38 times more likely to die by suicide as compared to those who never attempted suicide (Harris & Barraclough, 1997). With approximately 1 million suicide attempts nationally within one year, the cost to society is

astounding. In 2008, there were almost 200,000 hospitalizations due to suicide attempts and another 323,000 emergency department visits (CDC, 2012). For those attempts resulting in hospitalization, the economic cost is estimated at \$9,127 per suicide attempt with an additional \$11,146 for work-loss cost (Yang & Lester, 2007).

The research on suicide attempts in the U.S. military is startlingly sparse. Until 2008, the military did not have a systematic way to track suicide attempts. Currently, suicide attempts are captured in all branches of service through the Department of Defense Suicide Event Report (DoDSER) system (DoD, 2011). According to a review of civilian and military risk factors for suicide published in 2009, there is no reliable data on suicide attempts within the U.S. military (Martin, Ghahramanlou-Holloway, Lou, & Tucciarone, 2009). The U.S. Army reported the Army's suicide attempt numbers for Fiscal Year 2009, which equated to 1,713 suicide attempts (Department of the Army, 2010). The DoDSER annual report for calendar year 2010 indicated a total of 863 suicide attempts across all branches of service occurring within 837 individual Service Members (Department of Defense, Task Force on the Prevention of Suicide by Members of the Armed Forces, 2010). While these data are not from the same time period, it seems likely that there is some reporting inaccuracy within either the Department of the Army's statistics or the DoDSER statistics. This inconsistency of reporting is particularly problematic given the significant impact of suicide attempts within the military population. Based on a survey of health related behaviors among military members in 2008, 2.1% of Service Members reported making a suicide attempt within the past year, 1.1% reported a suicide attempt while serving in the military, and 2.5% reported making a suicide attempt before joining the service (Bray et al., 2010).

Suicide Attempt as Robust Risk Factor for Eventual Death by Suicide

Prospective studies. Given the importance of suicide attempts in regard to eventual death by suicide, a number of prospective studies have since been conducted to determine the percentages of individuals with a suicide attempt who will go on to die by suicide. Two prospective studies investigated percentages of individuals who went on to die by suicide within four years following a suicide attempt or a self-harm incident. In Denmark, 2.3% of individuals identified in the suicide attempt registry died by suicide within four years (Christiansen & Jensen, 2007). In England, individuals who presented to the emergency department due to deliberate self-harm were 34 times more likely to die by suicide than the general population (Cooper et al., 2005). A similarly designed study in New Zealand found that 4.6% of individuals presenting to the hospital for a suicide attempt, died by suicide within a 10-year follow-up period (Gibb, Beautrais, & Fergusson, 2005).

Other studies have used a longer follow-up period to determine if individuals with a history of suicide attempt will remain at risk for suicide many years after an index attempt. Individuals in Finland who presented to an intoxication unit within a hospital following a suicide attempt by overdose were followed for 37 years. Results indicate that 13.3% of individuals died by suicide during the follow-up period with almost two-thirds of the deaths occurring within 15 years following the index suicide attempt (Suominen et al., 2004). In another study, 7.8% of individuals hospitalized for either a suicide attempt or suicidal ideation died by suicide within a 30-year follow-up period (Wenzel et al., 2011). There is no clarification regarding whether those who died by suicide had previously been classified in the suicidal ideation group or the suicide attempt group,

making the exact percentage of those with a suicide attempt to eventually die by suicide unclear. Despite this uncertainty, the majority of the sample (70%) had originally been classified in the suicide attempt group (Wenzel et al., 2011).

Thus, the percentages of death by suicide following a suicide attempt or self-harm event can range based on follow-up length, geography, and study design. Owens, Horrocks, and House (2002) conducted a systematic review of 90 studies involving both suicide and non-fatal self-harm. The review split the studies into follow-up periods of one year, one to four years, four to nine years, and nine or more years and then calculated median proportions for repetition to include death by suicide. Results indicate that at one-year follow-up, 1.8% had died by suicide; 3% had died during one to four year follow-ups; 3.4% during four to nine years; and 6.7% of individuals had died by suicide in studies with nine or more years in the follow-up period (D. Owens et al., 2002). Altogether, the majority of studies show that up to 13% of individuals with a documented suicide attempt may be expected to die by suicide in the thirty years following the index suicide attempt. The question then becomes, of the individuals who die by suicide, how many have a history of suicide attempt.

Psychological autopsy studies. Psychological autopsy has become a common method for determining specific antecedents occurring before someone dies by suicide, including the presence or absence of prior suicide-related behaviors (Cavanagh, Carson, Sharpe, & Lawrie, 2003). The psychological autopsy method has been used internationally, allowing information to be gathered about individuals prior to their suicide in locations such as Finland, Sri Lanka, Scotland, China, Hong Kong, Taiwan, New Zealand, the U.S., and the United Kingdom. A psychological autopsy of suicides in

Finland revealed that 44% of the individuals had a previous suicide attempt (Isometsä & Lönnkvist, 1998). In Sri Lanka, 29% of individuals who died by suicide had a previous suicide attempt (Samaraweera, Sumathipala, Siribaddana, Sivayogan, & Bhugra, 2008), whereas two studies in the U.S. found that of individuals who died by suicide, 46% (Barracough, Bunch, Nelson, & Sainsbury, 1974) and 42% of individuals had a history of suicide attempt (Conwell et al., 1998).

Interestingly, Barracough and colleagues (1974) noted that a smaller percentage (8%) of those who died by suicide had made two or more previous suicide attempts. Additionally, Conwell and colleagues (1998) found a gender by age interaction in regard to previous attempt history. Specifically, the authors reported that of individuals who died by suicide, older women were more likely to have a history of suicide attempts than younger women, but older men were less likely to have a history of attempts than younger men.

Many psychological autopsy studies have used a case-control method to evaluate the individuals who have died by suicide compared to a living sample or a sample of individuals who have died by other causes. Many countries have used a case-controlled method with a living sample, all indicating that individuals who die by suicide are more likely to have a history of suicide attempt or deliberate self-harm as compared to a living sample. The likelihood of this history of self-harm ranges between populations studied. In Scotland, those who died by suicide were four times more likely to have a history of self-harm (Cavanagh, Owens, & Johnstone, 1999); in Taiwan, almost six times more likely (Cheng, Chen, Chwen-Chen, & Jenkins, 2000); in New Zealand, nine and a half times more likely (Beautrais, 2001); in the United Kingdom among those who did not

have access to mental health services, 39 times more likely (C. Owens, Booth, Briscoe, Lawrence, & Lloyd, 2003); in Hong Kong, 59 times more likely (Chen et al., 2006); and in Hong Kong among an elderly population, almost 37 times more likely to have a history of self-harm or suicide attempt compared to living controls (Chiu et al., 2004). One psychological autopsy report in China used a sample of individuals who died by injuries other than suicide as their control (Phillips et al., 2002). The authors found that those who died by suicide were almost 13 times more likely to have a history of suicide attempt compared to the control group.

Unfortunately, there is exceedingly sparse evidence to suggest how those individuals who have died by suicide with a suicide attempt history differ from those who have died without an attempt history. The only study to our knowledge to address this question was a review of death investigation files of Air Force members who died by suicide (Kochanski, 2012). In comparing those who died by suicide with a previous suicide attempt and those without a previous attempt, the only psychiatric difference noted was that those with a suicide attempt history were over two times more likely to have a documented Axis I disorder. Other studies have reported on suicide attempt histories among people who die by suicide and what is known is that in summarizing the studies cited, between 20 and 55% of individuals who die by suicide have a known previous history of self-harm or suicide attempt (e.g., Brown et al., 2000; Cheng et al., 2000).

Multiple suicide attempts and subsequent suicide death. It is clear that having a prior suicide attempt makes an individual at greater risk for dying by suicide, but it is unclear which of these individuals with a past suicide attempt will go on to die by

suicide. One possible explanation is that individuals who attempt suicide multiple times are at greater risk for dying by suicide as compared to those with only a single suicide attempt. There are several studies that lend credence to this theory.

One study in England followed individuals who presented to the hospital for a suicide attempt for a time period of approximately seven to ten years (Hawton & Fagg, 1988). Hawton and Fagg found that of the individuals who probably and definitely died by suicide during the follow-up period, 22% had two or more previous suicide attempts compared to only 6% in the surviving group, indicating that individuals with multiple suicide attempts were more likely to die by suicide. In a more recent study conducted in Denmark, a record review of individuals who presented to a poisoning center for self-poisoning were examined (Nordentoft et al., 1993). The individual medical records were then paired with death registry files within a ten year period to determine standardized mortality rates and relative risk ratios. Nordentoft and colleagues found that individuals with a history of multiple suicide attempts were over two times more likely to die by suicide compared to those individuals with only the one self-poisoning event.

While there has been no study to date looking at whether individuals with multiple suicide attempts within the military are at greater risk for death by suicide; there is one important study conducted in the U.S. among a Veteran population. Weiner and colleagues (2011) conducted a record review of Veterans who were being treated in an inpatient psychiatric unit for a suicide attempt. The follow-up period was between four and nine years, depending on time until death and the end of the study. Weiner and colleagues found that the Veterans with a subsequent hospitalization due to a suicide

attempt were 1.47 times more likely to have died by suicide as compared to the Veterans without a subsequent suicide attempt hospitalization (Weiner et al., 2011).

Additionally, there is anecdotal evidence to suggest that some military members who have died by suicide had previously attempted suicide multiple times. This anecdotal evidence is showcased in this personal story of suicide.

Age: 28 Rank/Occupation: Staff Sergeant/Infantry Branch of Service: U.S. Army
This Soldier was 28 years old and had completed multiple deployments. He suffered from post-traumatic stress disorder following his first tour where he had experienced close combat. When he left his unit because of transfer to another base, his post-traumatic stress and depressive symptoms worsened. Prior to his suicide, he made two unsuccessful attempts. His mother said the following about her son; "He felt most at home with his unit; he loved them and worked as hard as he could to be worthy of them. He gave his blood, sweat, and tears; he gave it all to them. I feel the Army let him down, and that when he needed them the most, they were not there for him." (DoD, 2010, pp. 85)

While there are few studies to report directly on the idea that multiple suicide attempt status individuals are at greater risk for death by suicide, there is an indication that this theory may be accurate.

Single versus Multiple Suicide Attempts

Although a history of suicide attempt is a major risk factor for eventual death by suicide, not all individuals with a history of suicide attempt will die by suicide. In fact, approximately 10 to 15% of individuals with a suicide attempt history will die by suicide (Cullberg, Wasserman, & Stefansson, 1988). One must then consider the possibility that

there are differences among individuals who attempt suicide – more specifically, differences among those with a single prior suicide attempt compared to those with two or more prior suicide attempts. Based on several studies cited above, multiple suicide attempt status individuals may be at a greater risk for death by suicide (e.g., Hawton & Fagg, 1988). The idea is credible that understanding differences between a single suicide attempt and multiple suicide attempts is important for suicide prevention efforts. The section below provides a summary of research findings on demographic, psychiatric, trauma history, and alcohol/drug use factors that best differentiate between individuals with a single versus a multiple attempt history. Additionally, the section then briefly summarizes the literature on individuals' wish to live versus wish to die, as well as relevant military studies.

Demographics. Research indicates that men die by suicide at a higher rate than women (De Leo, Bertolote, & Lester, 2002) and that women are more likely to attempt suicide than men (Goldsmith, Pellmar, Kleinman, & Bunney, 2002), but the differences between individuals with a single suicide attempt compared to multiple suicide attempts in regards to sex is not as clear. In Brazil, males were more likely to present to the hospital for their first suicide attempt whereas females were more likely to present for their second or more suicide attempt (Filinto da Silva Cais, Stefanello, Fabrício Mauro, Vaz Scavacini de Freitas, & Botega, 2009). In Hungary, females between the ages of 35 and 44 years were more likely to present for medical treatment with a history of multiple suicide attempts compared to a single attempt, whereas males with multiple suicide attempts were more likely to be between the ages of 20 and 35 years (Osváth, Kelemen, Erdős, Vörös, & Fekete, 2003). Additionally, there have been several studies comparing

individuals with a single suicide attempt to individuals with multiple attempts where sex was not found to be a significant predictor (Forman et al., 2004; Gupta, Trivedi, & Singh, 1992; Miranda et al., 2008), making the evidence on sex differences between single and multiple suicide attempters inconclusive.

Reports from the Centers for Disease Control and Prevention (CDC, 2010) refer to financial loss, social loss, and isolation from others as risk factors for suicide. Economic status appears to play a role in differentiating individuals with a single suicide attempt versus individuals with multiple attempts. Specifically, those with multiple attempts potentially have less economic freedom. Osváth and colleagues (2003) found that women who were economically inactive (unemployed, leave of absence or housewives) and men who were unemployed were more likely to present to the hospital with a past history of suicide attempt. Economically inactive individuals and women describing themselves as housewives were also more likely to have more than one suicide attempt (Filinto da Silva Cais et al., 2009). Individuals with more than one suicide attempt compared to a single attempt were more likely to be homeless (Kaslow, Jacobs, Young, & Cook, 2006) and unemployed males (Osváth et al., 2003). Social loss and isolation from others may also be greater among individuals with more than one suicide attempt given that living alone (Osváth et al., 2003) or being divorced, widowed, or separated have all been linked to more than one attempt (Kaslow et al., 2006; Osváth et al., 2003). As previously indicated, financial loss, social loss, and isolation from others have been identified as risk factors for suicide and it appears that individuals with multiple suicide attempts are more likely to experience these risk factors, compared to single attempt individuals.

Psychiatric factors.

Psychiatric symptoms. Given the possibility that having a history of more than one suicide attempt may put an individual at greater risk for death by suicide than a single attempt, it is logical to believe that more than one suicide attempt would also correlate with a higher severity of psychiatric factors than a single attempt. Hopelessness, an evidence-supported risk factor for death by suicide (CDC, 2010), has been shown to be higher amongst individuals presenting to a hospital with more than one suicide attempt as compared to those individuals presenting for their first suicide attempt (Filinto da Silva Cais et al., 2009; Forman et al., 2004; Kaslow et al., 2006).

Other psychiatric risk factors of suicide also shown to be higher amongst individuals with more than one suicide attempt are depression (Filinto da Silva Cais et al., 2009; Forman et al., 2004; Reynolds & Eaton, 1986) and suicidal ideation (Filinto da Silva Cais et al., 2009; Forman et al., 2004). Such individuals may be postulated to have more difficulty coping with internal and external stressors resulting in increased levels of hopelessness, depression, and suicidal ideation and eventual suicide attempt(s). In fact, there is some evidence to suggest that individuals with multiple suicide attempts may have more difficulty effectively managing internal and external stressors. Reynolds and Eaton (1986) found that individuals with three or more suicide attempts versus those with a single attempt who present to the emergency department have a poor coping history as assessed through clinical interview. Internally, individuals with two or more suicide attempts demonstrate more psychological distress (Kaslow et al., 2006) and more anger (Filinto da Silva Cais et al., 2009). Externally, individuals with multiple attempts show more difficulties in social role performance (Filinto da Silva Cais et al., 2009), poorer

problem solving (Forman et al., 2004), and demonstrate more disruptive behavior after multiple attempts (Miranda et al., 2008).

Psychiatric disorders. A history of psychiatric disorders is another factor that puts an individual at greater risk for suicide (CDC, 2010) and therefore at risk for suicide-related behaviors. In regards to general severity of psychopathology, there is evidence to suggest that individuals with more than one suicide attempt are at greater risk.

Individuals with multiple attempts have been found to have a higher number of overall symptoms (Kaslow et al., 2006) and longer duration of symptoms (Reynolds & Eaton, 1986), lower global assessment of functioning scores (Forman et al., 2004), more diagnoses (Forman et al., 2004; Miranda et al., 2008), higher levels of psychiatric comorbidity (Osváth et al., 2003), and long-term usage of psychiatric services (Stephens, 1987).

Additionally, a number of specific psychiatric issues have been observed among individuals with multiple suicide attempts. Personality disorders in general (Osváth et al., 2003), higher frequency of personality disorders (Gupta et al., 1992), and borderline personality disorder (Forman et al., 2004) have all been correlated with multiple suicide attempts compared with a single attempt. One particular study examined individuals with personality disorders over a ten-year period and investigated psychiatric differences between single and multiple attempt status (Boisseau et al., in press). The authors found that multiple suicide attempt status individuals were more likely to have a specific personality disorder of borderline personality disorder, but found no other differences in diagnoses (Boisseau et al., in press). Several clinical disorders have also been associated with more than one suicide attempt compared to a single attempt. Psychosis (Forman et

al., 2004) and psychotic disorders, mood disorders (Osváth et al., 2003), and anxiety disorders (Miranda et al., 2008) have all been correlated with more than one suicide attempt.

Family factors. Moreover, genetic vulnerability may also impact an individual's frequency of attempting suicide. Specifically, the CDC has identified a family history of suicide as a risk factor for eventual death by suicide and several studies have found that a family history of suicide and/or suicide attempt are more prevalent among individuals with more than one suicide attempt (Forman et al., 2004; Jeglic, Sharp, Chapman, Brown, & Beck, 2005; Reynolds & Eaton, 1986). Family psychopathology may also play a role in an individual having multiple suicide attempts versus a single attempt. Forman and colleagues (2004) found that individuals with multiple suicide attempts were more likely to have a family history of mental illness and Stephens (1987) found a higher incidence of family diagnoses and higher frequency of mothers with diagnoses to correlate with more than one suicide attempt in women.

Trauma history. Individuals with Posttraumatic Stress Disorder may display self-destructive and impulsive behaviors including attempting suicide (Foa, Keane, & Friedman, 2000), but there is also evidence to suggest that a history of trauma is more common among individuals with multiple suicide attempts. Filinto Da Silva Cas and colleagues (2009) found that individuals with a history of multiple suicide attempts were more likely to have reported emotional, physical, and sexual abuse than those with only a single attempt, but the authors did not specify the time period of the abuse. Other studies indicate that it may only be childhood abuse or trauma which correlates to multiple attempts.

Forman and colleagues (2004) found that individuals with multiple suicide attempts were more likely to have been emotionally abused in childhood, even after controlling for a diagnosis of borderline personality disorder. Additionally, women with a multiple suicide attempt history were more likely to report physical and sexual abuse in childhood (Stephens, 1987). In regard to trauma in general, women with multiple suicide attempts were less likely to have two parents in the home during childhood and more likely to have lost both parents than women with a single attempt (Stephens, 1987). Kaslow and colleagues (2006) also found that a higher number of traumatic events in childhood, but not in adulthood, correlated with multiple suicide attempts in women. Additionally, the number of traumatic events in the year prior to the index suicide attempt did not significantly correlate with a history of multiple suicide attempts (Kaslow et al., 2006). However, Pompili and colleagues (2011) found that repeat suicide attempt status was most predicted by having significant life events in childhood (e.g., loss of caregiver, abuse), significant life events 6 months prior to the index suicide attempt (e.g., loss of a partner, financial problems), and the interaction between the two.

History of alcohol and drug abuse. The CDC (2010) has identified a history of alcohol and drug abuse as risk factors for suicide. Evidence suggests that alcohol and drug abuse are also more commonly correlated to individuals with multiple suicide attempts than individuals with a single suicide attempt. As determined by clinical interview or validated substance abuse screening measure, individuals with multiple suicide attempts are more likely to abuse alcohol (Kaslow et al., 2006; Osváth et al., 2003; Reynolds & Eaton, 1986; Stephens, 1987) or abuse drugs (Kaslow et al., 2006; Reynolds & Eaton, 1986; Stephens, 1987). Additionally, based on self-report

questionnaires, individuals with multiple attempts are more likely to report a history of substance abuse diagnosis (Forman et al., 2004), or to have participated in substance-related treatment (Kaslow et al., 2006).

Wish to live versus wish to die. In 1964, Edwin Schneidman proposed that classifying suicidal individuals into groups of threatened suicide, attempted suicide, and suicide was not a useful classification system, as this system ignored any differences in the individuals prior to getting to that point of classification (Schneidman, 1964). Specifically, Schneidman argued that how an individual looks at their life or death is missing from the classification and therefore, he proposed that classifications should occur based on an individual's "psychological posture" toward life or death.

Later, Kovacs and Beck (1977) presented the first quantitative study examining what was termed the "internal struggle hypothesis of suicidal behavior". The hypothesis was based on the earlier theory written by Schneidman. In this study, Kovacs and Beck measured both the wish to live and wish to die of 106 individuals hospitalized for a recent suicide attempt. The authors compared the individuals' motivation or wish to live and wish to die to their assessed suicidal intent. Results indicated that half of the sample did experience ambivalence about living or dying, supporting the internal struggle hypothesis of suicidal behavior. Kovacs and Beck also found that those individuals with a unidirectional wish to die also had higher scores on the suicidal intent scale.

Brown and colleagues (2005) published a more recent and perhaps more seminal article on the topic of ambivalence and wishes to live or die. The authors conducted a 20-year prospective study with over 5,800 psychiatric outpatient participants. All participants were evaluated on their internal struggle for living or dying based on two

items from the Scale for Suicidal Ideation. The authors created a difference score based on the participants' ratings on the strength of their wish to live versus their wish to die. Results indicated that the hazard ratio for death by suicide among individuals who had a stronger wish to die than wish to live ranged from 2.68 to 6.51, with the former representing individuals with a lower difference score and the latter representing individuals with a higher difference score. These results occurred after controlling for a number of demographic and psychiatric factors, including a history of suicide attempt (Brown et al., 2005).

Evidence is emerging that having a stronger wish to die compared to a wish to live may be an independent risk factor for eventual death by suicide. Unfortunately, to our knowledge there has not been a study to examine how individuals with different suicide attempt statuses may think about living and dying in different ways.

Military studies. All of the studies reviewed to this point have been conducted within civilian samples only. To date, only one published study has examined individuals with single and multiple suicide attempts within the U.S. military (Rudd, Joiner, & Rahab, 1996). Rudd and colleagues (1996) conducted a study investigating similarities and differences among young active duty military members with suicidal ideation, a single suicide attempt, and multiple suicide attempts. Examining demographic factors, there were no differences between attempter status in regard to age, gender, or race (Rudd et al., 1996).

Although there were no demographic differences found, Rudd and colleagues (1996) found psychiatric differences. Military members with multiple suicide attempts scored higher on a hopelessness scale than military members with only a single attempt

or suicide ideation, as well as reported higher levels of depressive symptoms. Individuals with multiple suicide attempts were found to have higher levels of negative self-evaluation and tended to experience more hostility. In regard to a history of psychiatric disorders, Rudd and colleagues found that Service Members with more than one suicide attempt had more diagnoses and a younger age of onset of the first diagnosis.

There are many specific diagnoses that have been correlated to a multiple suicide attempt history within the civilian literature, including personality disorders. Rudd and colleagues (1996) found that borderline personality disorder traits was the only personality variable correlated with multiple attempts. Individuals with multiple attempts were more likely to have a range of anxiety disorders, including social and specific phobias, panic disorder, and a trend toward PTSD. Participants with multiple suicide attempts were also more likely to report alcohol abuse.

Additionally, although not yet published, a subset of this author's master's thesis contributes to the body of literature looking at single versus multiple suicide attempts within a military sample (Kochanski, 2012). A retrospective chart review was conducted to investigate relevant variables in electronic medical records of military individuals psychiatrically hospitalized for a suicide attempt. Individual records were then identified as either single or multiple suicide attempt status and were compared on a number of demographic, psychosocial, and psychiatric factors.

Findings indicated that psychiatrically hospitalized military male patients with multiple prior suicide attempts compared to those with a single prior attempt were almost two and a half times more likely to have documented problem substance use and almost three times more likely to have a mood disorder diagnosis. In comparison,

psychiatrically hospitalized military female patients with multiple prior suicide attempts compared to those with a single prior attempt were over two times more likely to have a documented history of childhood sexual abuse than those with a single attempt status (Kochanski, 2012).

Significance of Tertiary Suicide Prevention Efforts

There are three stages of prevention in regard to illness and injury (Green & Kreuter, 2005). The first stage is primary prevention which entails protecting health through environmental controls (Green & Kreuter, 2005). In regard to suicide prevention, this type of prevention would involve a program, such as one within a branch of military service created to promote overall psychological, physical, and spiritual health. Secondary prevention involves identifying and treating individuals with known risk factors for illness or injury (Green & Kreuter, 2005), such as treating individuals for depression because it is a known risk factor for eventual death by suicide. Finally, tertiary prevention is treatment to prevent the recurrence of illness or injury (Green & Kreuter, 2005). Tertiary prevention is the long-term goal of this work by identifying the factors that are associated with the recurrence of suicide attempts in the hopes of informing tertiary prevention practices.

Given the empirical evidence identifying a suicide attempt as one of the most robust and clinically meaningful risk factors for death by suicide (Brown et al., 2000), the extremely high economic cost of suicide attempts, and the high percentage of military members and civilians reporting a history of suicide attempt, tertiary prevention within the military and the civilian population seems critical. Additionally, there is substantial evidence suggesting that individuals with multiple suicide attempts present with a more

severe clinical picture (e.g., Forman et al., 2004; Kaslow et al., 2006) and even more critically, individuals with multiple suicide attempts may be at greater risk for death by suicide than those with a single suicide attempt (Christiansen & Jensen, 2007; Hawton & Fagg, 1988; Nordentoft et al., 1993; Weiner et al., 2011)

Summary

Suicide is a significant public health problem for civilians and military personnel. As indicated, a history of suicide attempt has been identified as a key risk factor for eventual death by suicide (Harris & Barraclough, 1977) and tertiary suicide prevention could be a key ingredient in preventing the recurrence of suicide-related behaviors. Yet, much remains unknown about the exact nature of risk for subsequent suicide given a person's attempt status (i.e., single versus multiple attempts) as well as clinically meaningful differences among the two groups. What the scientific literature (mostly cross-sectional studies) has shown is that individuals with multiple suicide attempts may be at an even greater risk for dying by suicide compared to those with a single suicide attempt (e.g., Weiner et al., 2011), possibly due to a more severe clinical picture associated with psychosocial stressors such as childhood abuse, family history of psychopathology, and higher levels of hopelessness and suicide ideation (e.g., Filinto Da Silva Cas et al., 2009). Furthermore, those with multiple suicide attempts demonstrate difficulties managing internal and external stressors, more severe psychiatric symptomatology, comorbidity of psychiatric diagnoses, and specific Axis I and Axis II diagnoses including alcohol and drug abuse (e.g., Forman et al., 2004).

Section II. Purpose and Significance

This dissertation aimed to examine psychiatric and wish to die/wish to live (i.e., ambivalence) differences among those with single versus multiple suicide attempts through secondary data analyses conducted on data acquired from both civilian and military suicidal individuals who participated in randomized controlled trials research. In addition to a cross-sectional examination of such differences at the time of a recent suicide attempt, the study design allowed for a comparison and tracking of such differences over time. To the best of our knowledge, this is the first study to examine such differences at different time intervals.

There are three longitudinal studies that indicate multiple suicide attempt status individuals may be at a greater risk for dying by suicide compared with single suicide attempt individuals (i.e., Hawton & Fagg, 1988; Nordentoft et al., 1993; Weiner et al., 2011). Two of these studies, however, were chart reviews preventing a detailed account of differences on symptom level variables (Nordentoft et al., 1993; Weiner et al., 2011). None of the three studies were designed to specifically look at characteristic differences among single versus multiple suicide attempt status individuals over time, therefore preventing any direct comparisons other than mortality rates. Additionally, Rudd and colleagues (1996) and Kochanski (2012) are the only investigators, to date, who have examined differences between military personnel with single versus multiple suicide attempts. The studies did not, however, investigate how military members may present differently than a clinical sample of civilians, nor were they able to look at suicide risk over time. Thus, this dissertation addresses an important research gap on the topic of single versus multiple suicide attempts, in a methodologically rigorous manner.

The purpose of this dissertation study was threefold: (1) to confirm that individuals with multiple versus a single suicide attempt exhibit a more severe clinical picture; (2) to determine if multiple versus single suicide attempt individuals sustain a more severe clinical picture over time; and (3) to evaluate potential differences between civilian and military individuals with multiple suicide attempts. Suicide prevention research and practice must directly address the unique assessment and treatment needs of the highly vulnerable subgroup of individuals with prior suicide attempts. However, to do so, we need a clear understanding of potential differences between those with a single versus multiple suicide attempts. To consider these two groups as having homogeneous needs may be detrimental to our national and DoD suicide prevention efforts.

Section III. Aims and Hypotheses

Aim 1: To determine the baseline wish to die/wish to live index that is significantly associated with suicide attempt status.

Hypothesis 1: Individuals with multiple suicide attempt status will show a significantly higher baseline wish to die/wish to live index.

Rationale: Given the evidence previously cited demonstrating multiple suicide attempt status individuals have higher levels of known suicide risk factors, e.g., mood disorder diagnoses and higher rates of depression and hopelessness (e.g., Forman et al., 2004); it may be that they can be classified as being in a higher risk category for dying by suicide. Brown and colleagues (2005) found that having a stronger wish to die/wish to live index put an individual at higher risk for suicide so it is hypothesized that multiple attempt status individuals would report higher wish to die/wish to live index scores, as they may be at greater risk for dying by suicide.

Aim 2: To examine the baseline psychiatric characteristics significantly associated with multiple suicide attempt status.

Hypothesis 2: A baseline psychiatric diagnosis of mood disorder, anxiety disorder, substance use disorder, an indication of Borderline Personality Disorder (BPD) traits, and indication of problem substance use will be associated with multiple suicide attempt status.

Rationale: Many cross-sectional studies have found significant differences between single and multiple suicide attempt status individuals based on psychiatric diagnoses, such as substance use disorders and personality disorders (e.g., Forman et al., 2004; Miranda et al., 2008). This hypothesis is in line with the current research on single versus multiple suicide attempt status.

Aim 3: To resolve whether psychiatric symptoms at baseline and the stability of those symptoms over time are related to suicide attempt status.

Hypothesis 3a: Individuals with multiple versus single suicide attempts will show significantly higher levels of depression, hopelessness, and suicidal ideation at baseline.

Hypothesis 3b: Individuals with multiple versus single suicide attempts will show more stability in levels of depression, hopelessness, and suicidal ideation from baseline to 1-month and from 1-month to 3-months.

Rationale: As previously discussed, multiple suicide attempt individuals have been shown to have a more severe clinical picture, specifically as it relates to identified risk factors for suicide. Cross-sectionally, individuals with multiple suicide attempts have higher rates of depression, hopelessness, and suicidal ideation (e.g., Rudd et al.,

1996). These individuals continue to attempt suicide, while many others never reattempt. This prediction is aimed at determining if a stability of high level risk factors for suicide (depression, hopelessness, suicidal ideation) is related to their multiple suicide attempts. In other words, perhaps these individuals reattempt suicide because they maintain higher levels of depression, hopelessness, and suicidal ideation over time.

Aim 4: To identify the baseline psychiatric characteristics that significantly differentiate military versus civilian participants with multiple suicide attempt status.

Hypothesis 4a: A baseline psychiatric diagnosis of mood disorder, anxiety disorder (non-PTSD), and an indication of BPD traits will be associated with being civilian status.

Hypothesis 4b: A baseline psychiatric diagnosis of PTSD and substance use disorder will be associated with being military status.

Rationale: The rationale for these hypotheses was primarily based on the military standards for enlistment, as related to behavioral health disorders. Specifically, individuals with mood disorders or anxiety disorders at the time of attempted enlistment do not meet the military standard (Department of the Army, 2011). Additionally having a history of an anxiety disorder or personality disorder are exclusionary items. A history of mood disorder is acceptable, as long as it did not require extensive treatment. Military members can be separated from the military for a personality disorder or for mood disorders or anxiety disorders requiring extensive treatment (Department of the Army, 2011). Based on the literature demonstrating a more severe clinical picture in multiple attempt individuals, it may be that military members have a different more severe clinical picture due to the screening and separation process. It was therefore hypothesized that

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the military members would be more likely to have PTSD diagnoses, given the estimates that OEF/OIF veterans have higher rates of PTSD compared to the civilian population (Gradus, 2007; Hoge et al., 2004). The Department of Veterans' Affairs has identified alcohol disorders and binge drinking to be highly comorbid with PTSD diagnoses (U.S. Department of Veterans Affairs, 2007); therefore making it possible the military multiple attempt individuals would also have higher rates of alcohol related issues.

Section IV. Methods

Overview

This dissertation study involved secondary analyses of outcome data collected in the context of four psychotherapy trials for the prevention of suicide. Specifically, these studies utilized a randomized clinical trial (RCT) design which involved longitudinal data collection at various follow-up intervals. Two of the RCTs were based on studies currently underway at the Uniformed Services University of the Health Sciences (USUHS). The remaining two RCTs consisted of studies conducted at the University of Pennsylvania (UPenn). A listing of study inclusion and exclusion criteria for each of the two sites is provided below.

The broad objective of the research, as stated previously, was to examine differences between participants with single versus multiple attempt status on a number of psychiatric factors. For the study analyses, baseline, 1- and 3- month assessment data were used given that all four identified studies shared these evaluation time points. To prepare a database for the planned analyses, assessment information collected from all four RCTs was merged into a single data file for all participants. Data from all RCTs were combined to create a heterogeneous sample to provide the most generalizability to

single and multiple attempt individuals. Additionally, by combining the data from all RCTs, there was sufficient power to detect a small effect size. In the sections below, information about participants, procedures, and measures employed for the four RCTs is provided. Details regarding demographics of each sample are provided in the results section under Aim 4.

USUHS RCTs

Participants. For inclusion in the USUHS RCTs, the following criteria were used. First, participants needed to be admitted to the inpatient psychiatric unit for one of two reasons: (1) a recent suicide attempt; and/or (2) suicide ideation + history of at least one lifetime suicide attempt. Second, all participants needed to be at least 18 years of age, able to communicate in English, and able to provide informed consent. Individuals with self-injurious behavior(s) without any intent to die, an incapacitating medical condition, active psychotic symptoms, and/or expected early discharge from the inpatient unit within 72 hours were excluded from the study.

Recruitment and informed consent. Service Members and dependents admitted for psychiatric inpatient hospitalization at WRNMMC for suicide-related reasons, with either a current or lifetime suicide attempt, were considered for recruitment into the study. Attending physicians, following a brief discussion with the patient and a review of initial eligibility criteria, referred the patient for the RCT and notified the study team about permission from the patient to be approached by a research team member. If permission was given, a research team member approached the patient, provided a brief overview of the study, and answered relevant questions. All patients initially agreeing to participate in the study were then taken through the informed consent process approved

by the institutional review boards. At the end of the informed consent, all participants were given a brief quiz to ensure understanding of the document.

Procedure. Data from the USUHS RCTs were extracted from two current psychotherapy studies aimed at the reduction of subsequent suicide-related behaviors following psychiatric hospitalization. Data collection began in January 2011 and is expected to end by August 2013. A total of 74 participants are expected to be enrolled in both studies. At the time of initiation for this dissertation, a total of 42 participants had been enrolled. In the first USUHS RCT, suicidal inpatients (meeting study eligibility criteria as noted above), regardless of type of psychiatric diagnosis, were randomly assigned to Post Admission Cognitive Therapy (PACT) or Usual Care (UC). In the second USUHS RCT, inpatients (meeting study eligibility criteria as noted above), with a history of trauma and/or trauma-related diagnosis, were randomized to PACT adapted for trauma or UC.

Baseline assessments and cognitive therapy sessions were conducted by postdoctoral fellows in clinical or counseling psychology or by licensed clinical psychologists. These team members completed a minimum of over 40 hours of training in the same topic areas, but also completed training on the treatment protocol. Study therapists attended biweekly individual supervision and weekly group supervision to discuss assessment and treatment related issues.

Baseline assessments were performed preferably within 24 hours of informed consent. The baseline assessment includes a number of self-report measures, as well as a number of clinician administered measures. Table 1 presents all measures administered in the study and the timeline of administration. After completing the baseline

assessment, randomization notifications were provided to study participants. Participants randomized into the intervention group received six 90-minutes sessions of individual cognitive therapy designed specifically to target suicidal behavior and the prevention of its recurrence. For this dissertation, data from follow-up telephone assessments completed at 1- and 3- months post hospital discharge were used.

UPenn RCTs

Participants. For inclusion in the UPenn RCTs, the following criteria were used. First, participants needed to present to the Emergency Department (ED) for a suicide attempt occurring within the past 48 hours. Second, all participants needed to be at least 16 years of age, able to communicate in English, able to provide informed consent, able to complete the baseline assessment, and able to provide 2 verifiable contacts for future tracking purposes. Individuals with a medical condition preventing them from participating in an outpatient treatment program were excluded from the study.

Recruitment and informed consent. All individuals who presented to the Hospital of the University of Pennsylvania, Philadelphia ED were evaluated for a suicide attempt within 48 hours and considered for recruitment into the study. For the eligible participants transferred to the inpatient psychiatric unit, attending physicians granted the research team permission to approach the participant regarding participation in the study. For the eligible participants not admitted to the inpatient unit, research assistants contacted them by phone and acquired an initial verbal consent. All participants initially agreeing to participate in the study were then taken through the informed consent process approved by the institutional review boards.

Procedure. Data from the UPenn RCTs was extracted from two completed psychotherapy studies aimed at the reduction of subsequent suicide-related behaviors following an ED visit for a suicide attempt. A total of 260 participants were enrolled in both studies. In both UPenn RCTs, suicidal individuals who presented to the ED (meeting study eligibility criteria as noted above), regardless of type of psychiatric diagnosis, were randomized to Cognitive Therapy (CT) or Usual Care (UC).

Baseline assessments and cognitive therapy sessions were conducted by trained postdoctoral fellows or community mental health providers in social work, psychology, or psychiatry. These team members completed a minimum of over 40 hours of training in the same topic areas, but also completed training on the treatment protocol. Study therapists attended biweekly individual supervision and weekly group supervision to discuss assessment and treatment related issues.

Baseline assessments were performed preferably within 3 days, but no longer than 3 weeks from the index suicide attempt. The baseline assessment included a number of self-report measures, as well as a number of clinician administered measures (see Table 1). After completion of the baseline assessment, randomization notifications were provided to study participants. Participants randomized into the intervention group received ten weekly or biweekly 60-minutes sessions of individual cognitive therapy designed specifically to target the suicidal behavior and the prevention of its recurrence. For this dissertation, follow-up in-person assessments completed at 1- and 3- months post baseline assessment were used.

Protection of Human Participants

This dissertation study has been reviewed by the Uniformed Services University of the Health Sciences (USUHS) Institutional Review Board (IRB) and found to be exempt given the secondary analyses pertaining to de-identified data. Required USUHS graduate student forms for this dissertation have been completed. Additionally, this study was registered with the USUHS Office of Sponsored Programs and the Graduate Education Office. Originally, institutional review board approvals for all RCTs were obtained from the appropriate regulatory boards. For the USUHS RCTs, approvals were obtained from the WRNNMC Department of Clinical Investigations, the USUHS IRB, as well as the DoD Human Research Protections Office (HRPO). For the UPenn RCTs, approvals were obtained from the University of Pennsylvania IRB.

A number of safety measures were implemented to protect the participants of the studies. These strategies ranged from maintaining all identifying information in a secure manner, either through physical locks or encryption software for electronic data to maintaining a risk assessment protocol for individuals with active suicidal ideation. Additionally, great care was to ensure all individuals fully understood the informed consent process, including all possible risks associated with their participation in the study.

Measures

Demographic information [Baseline]. Participants in all RCTs were asked to fill out a Locator and Demographic Form (see Appendix A for USUHS RCTs and Appendix B for UPENN RCTs) which collected (1) participant contact information to be

used during the follow-up assessments; (2) demographic information and; (3) military service information for the USUHS RCTs.

Psychiatric information.

Symptom level variables. In order to capture symptom-level experiences identified as suicide risk factors, several self-report measures were used. For gathering participants' depression severity in all RCTs, the Beck Depression Inventory-Second Edition¹ (BDI-II; Beck, Steer, & Brown, 1996) was used at baseline, 1-, and 3-months. The BDI-II is a 21-item self-report questionnaire primarily used for measuring depression severity. The BDI-II is a modernized version of the BDI-IA, revised to capture the symptoms of a depressive disorder based on the DSM-IV criteria. The measure asks participants how they have been feeling for the past two weeks, including the day of assessment and provides a 4-point Likert-scale for each answer. The measure takes approximately 5 to 10 minutes to complete. Total scores are used to determine depression severity ranging from minimal (0-13) to mild (14-19) to moderate (20-28) to severe (29-63). The BDI-II has demonstrated good psychometric properties in both clinical and normal populations with good internal consistency (Chronbach's alpha = .92) and good test-retest reliability, reported as .93 (Beck et al., 1996).

The Beck Hopelessness Scale¹ (BHS; Beck & Steer, 1988) was used to assess participants' level of hopelessness about the future at baseline, 1-, and 3-months. The BHS is a 20-item true/false measure specifically tapping into the degree of negative views of both the short-term and long-term future an individual may have. The BHS has been used to measure the construct of hopelessness underlying a number of psychiatric

¹ A copy of the measures can be provided upon request. Due to copyright infringement, the measures have not been included in the dissertation appendices.

disorders, to include suicidality. The measure takes approximately 5 to 10 minutes to complete. Total scores can be used clinically to determine level of hopelessness ranging from minimal (0-3) to mild (4-8) to moderate (9-14) to severe (14+). The BHS has demonstrated good psychometric properties in both clinical and normal populations with good internal consistency (KR-20 ranging from .82 to .93), test-retest reliability at 1 week (correlation = .69), and high interrater reliability, reported as .86 (Beck & Steer, 1988).

The Scale for Suicide Ideation² (SSI; Beck, Kovacks, & Weissman, 1979) was used to assess participants' level of suicidal intent at baseline, 1-, and 3-months. The SSI is a 21-item instrument designed to measure the intensity of a participant's suicidal intention on a conscious level. The measure takes approximately 10 minutes to complete and items 1-19 utilize a 3-point Likert-scale for answers with items #20 and #21 used to determine relevant background factors. Total scores range from 0 to 38. The first five items determine if any suicidal ideation is present and if so, the remaining items were administered to assess suicidal intent, deterrents, and plans. The SSI evaluates both current level of suicidal intent, as well as level of suicidal intent when the individual was feeling the worst, labeled SSI-*current* and SSI-*worst*, respectively. The baseline SSI-*worst* captured the worst point in life and the follow-up SSI-*worst* captured the worst point since the last assessment period. The SSI has demonstrated good psychometric properties and in factor analysis has distinguished three meaningful factors: (1) active suicidal desire, (2) specific plans for suicide, and (3) passive suicidal desire. The internal consistency has been reported as high (Chronbach's alpha = .89) and high interrater reliability (.83) has been reported (Beck et al., 1979).

² A copy of the measures can be provided upon request. Due to copyright infringement, the measures have not been included in the dissertation appendices.

Item 1 and item 2 were used from the SSI to investigate the participants' level of motivation for living or dying. Item 1 asks participants to indicate their wish to live as either "Moderate to Strong", "Weak", or "None", coded as 0, 1, and 2, respectively. Item 2 asks participants to indicate their wish to die as either "None", "Weak", or "Moderate to Strong", coded as 0, 1, and 2, respectively. For the purpose of this study, a wish to die/wish to live index was created to assess motivation. The wish to live item was reverse coded and then subtracted from the wish to die score, creating the wish to die/wish to live index score ranging from 2 to -2 with positive scores indicating a stronger wish to die and negative scores indicating a stronger wish to live. This procedure was outlined in Brown and colleagues (2005). The wish to die/wish to live index score was calculated for current state, as well as for the time when the individual felt the worst (either lifetime or since the last assessment), labeled *WDWL-current* and *WDWL-worst*, respectively.

The Alcohol Use Disorders Identification Test: Self-Report Version³ (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) was used in order to identify problematic substance use at baseline in the USUHS RCTs. The AUDIT is a 10-item questionnaire designed to screen for individuals whose alcohol use has become problematic or harmful. The measure takes approximately 2 minutes to complete and it utilizes a 5-point Likert-scale for questions related to the amount and frequency of alcohol consumption, alcohol dependence, and problematic alcohol use. Total scores range from 0 to 40 and the AUDIT manual recommends using a total score of eight or more as the cut-off to indicate hazardous and harmful alcohol use. The AUDIT has

³ A copy of the measures can be provided upon request. Due to copyright infringement, the measures have not been included in the dissertation appendices.

demonstrated good psychometric properties and is best suited to primary care patients, psychiatric inpatients, and the elderly (Berner, Kriston, Bentele, & Härter, 2007). Specifically, the AUDIT's sensitivity level is approximately .95 and specificity over .80. The test-retest reliability is .86. An independent drug screening measure was not administered in the USUHS sample; however, a section in the Mini International Neuropsychiatric Screen & Interview (see below section) addresses both drug dependence and abuse. An answer to yes on any of these 11 questions resulted in a "yes" designation for the problem drug use variable. Alcohol and drug screening measures (see Appendix C and Appendix D, respectively) were used to determine problematic alcohol or drug use at baseline in the UPenn RCTs. Both screening measures are 13-items, assessing frequency and quantity of alcohol and drug use. Additionally, the last 8 questions on both measures ask items pertaining to problem alcohol and drug use. An answer to yes on any of these 8 questions resulted in a "yes" designation for the problem alcohol or problem drug use variable for this study.

Diagnosable disorders. In order to identify diagnosable psychiatric disorders, the Mini International Neuropsychiatric Screen & Interview⁴ (MINI; Sheehan et al., 1997) was administered at baseline in the USUHS RCTs. The MINI is a structured clinical interview designed to assess psychiatrically diagnosable disorders as indicated by the DSM-IV. It consists primarily of closed yes/no questions taking approximately 20 minutes to administer. The MINI has been shown to have good psychometric properties for accurately diagnosing psychiatric disorders with sensitivity above .70 and specificity of .85 (Sheehan et al., 1997). The Structured Clinical Interview for Axis I of the

*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*⁴ (SCID-I; Spitzer, Gibbon, & Williams, 1995) was administered at baseline in the UPenn RCTs. The SCID-I is a semi-structured clinical interview designed to assess psychiatrically diagnosable disorders as indicated by the DSM-IV. It consists primarily of closed yes/no questions taking approximately 90 minutes to administer. The SCID-I is a psychometrically solid tool for accurately diagnosing psychiatric disorders and is highly concordant with the MINI. It has also shown good test-retest reliability with correlations ranging from .61 to .68 (Spitzer et al., 1995).

The Personality Belief Questionnaire Short Form⁵ (PBQ-SF; Butler, Beck, & Cohen, 2007) was used in order to identify any indication of BPD traits at baseline in the USUHS RCTs. The PBQ-SF is a 65-item questionnaire designed to evaluate an individual's beliefs as they pertain to Axis II diagnoses identified in the Diagnostic and Statistical Manual for Mental Disorders 4th Edition (DSM-IV; American Psychiatric Association, 1994). The measure employs a 5-point Likert-scale, asking the participant to rate the extent to which the participant believes the statement listed. For this study, individual item scores corresponding to BPD were calculated into BPD z-scores. Participants with z-scores for BPD items equal to one half a standard deviation higher than average, were designated as having an indication of BPD traits. The PBQ-SF has shown good psychometric properties with good internal consistency (Cronbach's alpha coefficients ranging .81 to .92) and good test-retest reliability (ranging from .57 to .82; Butler et al., 2007). A BPD screening measure (see Appendix E) was used to determine

⁴ A copy of the measures can be provided upon request. Due to copyright infringement, the measures have not been included in the dissertation appendices.

⁵ A copy of the measures can be provided upon request. Due to copyright infringement, the measures have not been included in the dissertation appendices.

an indication of BPD traits at baseline in the UPenn RCTS. This measure is a 15-item clinician administered scale with questions in line with the DSM-IV-TR diagnosis for BPD. For the purpose of this study, a positive screen on the measure was used for an indication of BPD traits, which required 5 items to be endorsed with at least three examples for each item.

Section V. Data Analytic Methods

Data Construction

As previously stated, data for this study was obtained from four different RCTs and the focus of the project was to conduct secondary analyses as they pertain to single versus multiple suicide attempt status. The procedure for obtaining the applicable data were as follows: (1) a brief proposal was drafted including relevant background information, significance of proposed study, and specific aims for the project; (2) preliminary approval to have access to the data from all RCTs was obtained verbally by this author from the Principal Investigators, Dr. Marjan Holloway (USUHS RCTs) and Dr. Aaron Beck and Dr. Gregory Brown (UPenn RCTs); (3) a list of relevant variables and measures with required data collection time points to be used for this project was created; (4) approval for the conduct of the project was requested and obtained from the USUHS Office of Research and IRB; (5) a telephone meeting with Dr. Gregory Brown was conducted in which discussion of the applicable UPenn RCTs data took place; and (6) a meeting with Dr. Marjan Holloway was conducted in which discussion of the applicable USUHS RCTs data took place. After obtaining approval from the dissertation committee on the proposal, data from all four RCTs was transferred to this author.

All RCTs gathered data on the same constructs, though there were some differences in assessment measures used. Table 2 is a list of relevant study constructs with the associated measures and variables that were used for data analysis. In order to ensure all variables were in the same format for data analysis, any differences in data format were recoded. Table 3 is a list of originally formatted variables from all RCTs and the recoded variables analyzed for this study.

Statistical Procedures

Software. All data were analyzed using the *Statistical Package for the Social Sciences* software package, version 19.0 (SPSS v. 19.0). Power analyses were conducted using G*Power 3.1.

Power and anticipated sample size. At the time of the dissertation proposal, *a priori* power analyses were conducted for each specific aim of the study using an estimated sample size of $N = 310$. With the original estimated sample size, this study was adequately powered to detect a small to medium effect size, depending on the aim. The final sample size was $N = 299$; therefore power analyses were rerun for each specific aim and details are provided below.

Covariates. The first step in the data analytic strategy was to determine appropriate covariates necessary to control for in the remaining analyses. Bivariate analyses were conducted to determine the appropriate covariates. For all bivariate analyses, the variable suicide attempt status (Single/Multiple) was analyzed with the following variables separately: (1) condition (Treatment/Control); (2) sample (Military/Civilian); (3) age (continuous variable); (4) sex (Male/Female); (5) race/ethnicity (Caucasian/African-American/Asian/Other); (6) marital status

(Married/Never Married/Divorced, Separated, Widowed); and (7) education (High School/Some College/College Graduate/Advanced Degree). All categorical variables were analyzed using Chi-Square analyses and a t-test was used to analyze age. Any variables found to be related to suicide attempt status were used as covariates in remaining analyses.

Power and bivariate analyses. An *a priori* power analysis for a Chi-Square test was conducted for these analyses. Based on the final sample size for this study of $N = 299$ for a maximum sized 2×4 contingency table with an alpha level of 0.05 and achieved power of 80%, a small effect size equivalent to $\phi = 0.19$ would be detectable. An *a priori* power analysis for a two-tailed independent t-test was conducted to examine age and suicide attempt status. Based on a final sample size of $N = 299$ with an alpha level of 0.05 and achieved power of 80%, a small effect size equivalent to Cohen's $d = 0.36$ would be detectable.

Aim 1: To determine the baseline wish to die/wish to live index that is significantly associated with suicide attempt status.

Hypothesis 1: Individuals with multiple suicide attempt status will show a significantly higher baseline wish to die/wish to live index.

Aim 1 statistical procedure. To address aim 1, a between-subjects comparison of the participants' wish to die and wish to live was conducted. The independent variable analyzed was suicide attempt status (Single/Multiple). The dependent variable analyzed was wish to die/wish to live index. This difference score was created by subtracting the participant's reverse score on SSI Item 1 wish to live from the score on Item 2 wish to die. This calculation resulted in a difference score ranging from -2 to +2, where a

negative score indicated a stronger wish to live and a positive score indicated a stronger wish to die. An independent samples t-test was conducted to address this aim with above stated variables.

Aim 1 power analysis. An *a priori* power analysis for a two-tailed independent samples t-test was conducted for this aim. Based on a final size of $N = 299$ for a two-tailed independent samples t-test with an alpha level of 0.05 and an achieved power of 80%, a small effect size of Cohen's $d = 0.36$ will be detectable.

Aim 2: To examine the baseline psychiatric characteristics significantly associated with multiple suicide attempt status.

Hypothesis 2: A baseline psychiatric diagnosis of mood disorder, anxiety disorder, substance use disorder, an indication of BPD traits, and indication of problem substance use will be associated with multiple suicide attempt status.

Aim 2 statistical procedure. To address aim 2, a regression model was conducted to predict suicide attempt status based on psychiatric variables. The dependent variable analyzed was suicide attempt status (Single/Multiple). The independent variables included in the model were: (1) mood disorder (Yes/No); (2) non-PTSD anxiety disorder (Yes/No); (3) PTSD (Yes/No); (4) substance use disorder (Yes/No); (5) other Axis I disorder (Yes/No); (6) problem substance use (Yes/No); and (7) indication of BPD traits (Yes/No). A binary logistic regression was conducted to address this aim with above stated variables.

Aim 2 power analysis. An *a priori* power analysis for a logistic regression was not calculated for this aim given the complicated formula requirements; however an estimate was determined by using a Chi-Square power analysis. Based on the final

sample size for this study of $N = 299$ for a maximum sized 2×2 contingency table with an alpha level of 0.05 and achieved power of 80%, a small effect size equivalent to $\phi = 0.16$ would be detectable. To account for multiple variables in the logistic regression model, a medium correlation between variables of 0.40 is estimated, requiring an additional 60 participants to achieve 80% power. Given the final sample size of $N = 299$ and to maintain an achieved power of 80%, the small effect size detectable was increased to $\phi = 0.18$.

Aim 3: To resolve whether psychiatric symptoms at baseline and the stability of those symptoms over time are related to suicide attempt status.

Hypothesis 3a: Individuals with multiple versus single suicide attempts will show significantly higher levels of depression, hopelessness, and suicidal ideation at baseline.

Hypothesis 3b: Individuals with multiple versus single suicide attempts will show more stability in levels of depression, hopelessness, and suicidal ideation from baseline to 1-month and from 1-month to 3-months.

Aim 3 statistical procedure. Only participants in the control condition were used for these analyses in order to ensure results were not impacted by treatment effects. Additionally, to account for the possible change of attempt status from single to multiple over time, participants who were identified as single attempt status at baseline, but made another suicide attempt during the study period, were identified and labeled accordingly. For example, a single suicide attempt status individual at baseline who reattempted suicide at the 3-month follow-up then became classified as a multiple suicide attempt status individual at 3-months for the analyses.

To address aim 3, a within and between subjects comparison of the participants' psychiatric symptoms was conducted. The between subjects independent variable analyzed was suicide attempt status (Single/Multiple) and the within subject independent variable analyzed was time (Baseline/1-Month Follow-up/3-Month Follow-up). The dependent variables analyzed were (1) depression (BDI-II); (2) hopelessness (BHS); (3) *current* suicidal ideation (SSI-*current*); and (4) *worst* suicidal ideation (SSI-*worst*). Hierarchical Linear Modeling (HLM) was conducted to address this aim with the above stated variables. Given the longitudinal nature of this aim, all commonly used covariance structures for longitudinal analyses were examined and the best fit for the data was the structure selected. Additional details on the model fitting process are provided in the Results section.

Aim 3 power analysis. In order to conduct a power analysis for HLM, an effective sample size (ESS) must be determined (Killip, Mahfoud, & Pearce, 2004). According to Killip and colleagues, it is important to consider within group or cluster variance to determine the effective sample size. The ESS is an estimate that takes into account both the additional data points with multiple time points of measurement and the loss of independence in a repeated measures design, effectively determining a sample size that is higher than the number of participants, but smaller than the total number of observations. In this study, the cluster is the subject, and observations on the same subject are expected to be correlated. It was estimated that the participants' scores would be highly correlated between time points; therefore the intraclass correlation coefficient (ICC) was estimated at .70. This estimate was used based on reported test-retest reliability of the BDI-II, BHS, and SSI. To determine the ESS, the sample size times the

number of observations per participant is divided by the design effect, calculated as $1 + ICC(m-1)$. Using an $ICC = .70$, $n = 149$, and $m = 3$ observations per person, the ESS was estimated at 186. The figure 186 then becomes the available sample size for power analysis.

An *a priori* power analysis for a within and between subjects repeated measures analysis of variance (ANOVA) was then conducted. Based on an effective sample size of $n = 186$ for a repeated measures ANOVA with an alpha level of 0.05 and an achieved power of 80%, a medium effect size equivalent to Cohen's $f = 0.23$ would be detectable.

Aim 4: To identify the baseline psychiatric characteristics that significantly differentiate military versus civilian participants with multiple suicide attempt status.

Hypothesis 4a: A baseline psychiatric diagnosis of mood disorder, anxiety disorder (non-PTSD), and an indication of BPD traits will be associated with being civilian status.

Hypothesis 4b: A baseline psychiatric diagnosis of PTSD and substance use disorder will be associated with being military status.

Aim 4 statistical procedure. To address aim 4, the first step was to conduct a series of independent bivariate analyses. For all bivariate analyses, the variable military status (Military/Civilian) was analyzed with the following variables separately: (1) mood disorder (Yes/No); (2) non-PTSD anxiety disorder (Yes/No); (3) PTSD (Yes/No); (4) substance use disorder (Yes/No); (5) other Axis I disorder (Yes/No); (6) problem substance use (Yes/No); and (7) indication of BPD traits (Yes/No). All variables were analyzed using Chi-Square analyses. All variables in the bivariate analyses resulting in a significant p-value less than or equal to .10 were then entered into a logistic regression

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model. The purpose of conducting the bivariate analyses first was to increase the stability of the logistic regression model and to avoid over-fitting by excluding any non-significant variables. The dependent variable analyzed was military status (Military/Civilian) and the independent variables were any significant variables listed above.

Aim 4 power analysis. An *a priori* power analysis for a multiple logistic regression was not calculated for this aim given the complicated formula requirements; however an estimate was determined by using a Chi-Square power analysis. In this aim, only multiple suicide attempt status individuals were included in the analyses; therefore the sample size included in these analyses was $n = 214$. Based on the sample size for this aim of $n = 215$, for a maximum sized 2 X 2 contingency table with an alpha level of 0.05 and achieved power of 80%, a small effect size equivalent to $\phi = 0.19$ would be detectable. To account for multiple variables in the logistic regression model, a medium correlation between variables of 0.40 was estimated, requiring an additional 36 participants to achieve 80% power. Given the sample size of 214 and to maintain an achieved power of 80%, the small to medium effect size detectable was increased to $\phi = 0.21$.

Section VI. Results

The merging of data from the UPenn RCTs and the USUHS RCTs resulted in a combined sample of 302 participants. Three participants were excluded from all analyses because their suicide attempt status (single versus multiple) was unknown. Therefore, a final sample of 299 participants (86.9% from UPenn RCTs and 13.1% from USUHS RCTs) was used for subsequent analyses which are reported in the sections below.

Demographic Characteristics

Table 4 presents the demographic characteristics of the 299 RCT participants. The mean age of the sample was 35.20 years ($SD = 10.28$, range of 18 to 66 years). Males represented 46.8% ($n = 140$) of the sample compared with females who represented 51.8% ($n = 155$). Approximately half of the sample (50.2%) consisted of African-American participants, followed by Caucasians (38.5%), Hispanics (4.3%), Asians (1.3%), and those from other ethnicities (4.0%). The majority of the sample had never been married (47.8%), while a somewhat equal percentage had been married (22.7%) and divorced/separated/widowed (25.1%). Approximately a third of the participants had not completed their high school education; about half had either a high school education or some college whereas only an eighth had completed an advance degree.

In terms of military status, of the 39 participants from USUHS, approximately 67% were active duty (25.7% Navy, 20.5% Marine Corps, 17.9% Army, and 2.6% Air Force). Approximately 2.6% were members of the Army Reserves, 5.1% National Guard, and 5.1% Coast Guard with the remaining 7.7% consisting of military dependents. Military status information remained unknown for 12.8%.

Suicide Attempt Characteristics

Figure 1 presents a graphical representation of the suicide attempt characteristics of the 299 RCT participants. At baseline, 28.1% ($n = 84$) of study participants had a single suicide attempt versus 71.9% ($n = 215$) who had at least two suicide attempts. Among the 84 study participants with a single suicide attempt at baseline, 6.0% ($n = 5$) made a second suicide attempt before the 1-month follow-up and 2.4% ($n = 2$) made a

second suicide attempt at the 3-month follow-up. Among the 215 study participants with multiple suicide attempts at baseline, 7.4% ($n = 16$) made another suicide attempt before the 1-month follow-up and 12.6% ($n = 27$) made another suicide attempt at the 3-month follow-up. There were no reports of any participants dying by suicide during the course of the 3-month follow-up.

Baseline Psychiatric Characteristics

Table 5 presents the baseline psychiatric symptomatology of the 299 RCT participants. The overall sample was severely depressed as evidenced by a mean BDI-II total score of 31.18 ($SD = 13.15$), somewhat higher than a large outpatient sample with a mean of 22.45 ($SD = 12.75$; Beck, Steer, & Brown, 1996). The sample was moderately hopeless as evidenced by a mean BHS total score of 11.55 ($SD = 6.23$), slightly higher than BHS scores ($M = 8.41$, $SD = 6.15$) reported in a large suicidal inpatient sample (Beck & Steer, 1989). In terms of suicide ideation severity, participants showed a mean SSI *current* score of 12.34 ($SD = 11.67$) and a mean SSI *worst* score of 27.27 ($SD = 6.54$). These scores are much higher than average SSI scores seen in a depressed outpatient sample ($M = 4.42$, $SD = 5.77$; Beck et al., 1979). The wish to die/wish to live *index-current* was -0.19 ($SD = 1.50$), indicating a slightly stronger wish to live than wish to die at the time of baseline; the wish to die/wish to live *index-worst* was 1.53 ($SD = 0.86$), indicating a moderately stronger wish to die than wish to live at the time of worst suicidal crisis in their life.

Table 5 presents the baseline psychiatric diagnostic characteristics of the 299 RCT participants. On average, participants received a total of 3 psychiatric diagnoses on Axis I at baseline ($SD = 1.05$). The primary axis I diagnostic category was mood

disorders (89.0%) followed by substance disorders (67.6%), and anxiety disorders (58.9%). Furthermore, problem substance use was highly prevalent with 59.5% indicating problem alcohol use and 66.2% problem drug use. In terms of anxiety disorders, just over one third of the sample was diagnosed with a non-PTSD anxiety disorder (35.5%) and just less than one quarter was diagnosed with PTSD (23.4%). Axis II diagnostic information was not available. However, 32.4% of the sample showed some indication of traits associated with borderline personality disorder.

Covariates

Chi-square analyses were first conducted to examine the associations between suicide attempt status (single versus multiple) and all demographic variables, with the exception of age, and in order to determine appropriate covariates for the planned subsequent analyses. Individuals with single versus multiple suicide attempt status did not demonstrate statistically significant frequency differences based on sex, $\chi^2(1) = 0.03$, $p = .974$; race/ethnicity, $\chi^2(2) = 1.28$, $p = .529$; marital status $\chi^2(2) = 0.99$, $p = .610$; or education, $\chi^2(4) = 2.36$, $p = .670$. Second, an independent samples t-test was conducted to examine the relationship between suicide attempt status and age. No significant between group differences based on suicide attempt status, $t(122.57) = -0.11$, $p = .909$ were found on age. Finally, chi-square analyses were conducted to determine if suicide attempt status was associated with different RCTs, $\chi^2(3) = 0.53$, $p = .913$, and assignment to treatment or control group, $\chi^2(1) = 1.01$, $p = .316$. Results were also non-significant. Given the results of these analyses, no covariates were used for the remaining baseline analyses examining single versus multiple attempt status differences.

Wish to Die/Wish to Live Index and Suicide Attempt Status (Aim 1)

A two-tailed independent samples *t*-test was conducted to determine the relationship between wish to die/wish to live index scores and suicide attempt status. In the first analysis, the *current* wish to die/wish to live index served as the dependent variable and suicide attempt status (single versus multiple) served as the independent variable. In the second analysis, the *worst* wish to die/wish to live index (asked about worst lifetime) served as the dependent variable and suicide attempt status (single versus multiple) served as the independent variable. Individuals with multiple suicide attempt status were expected to show a significantly higher baseline wish to die/wish to live index (i.e., a stronger wish to die) – both for *current* and *worst* times. Overall, the hypothesis was confirmed for both *current* and *worst* wish to die/wish to live index scores. In both types of measurement, individuals with a multiple attempt versus a single attempt showed a relatively stronger wish to die or a relatively weaker wish to live.

A significant difference between the single attempt group ($M = -.52, SD = 1.59$) and the multiple attempt group ($M = -.06, SD = 1.45$) was found on the *current* wish to die/wish to live index, $t(138.5) = 2.30, p = .023$. The results equate to a small effect size (Cohen's $d = -0.33$). Equal variances were not assumed based on a significant Levene's Test ($F = 4.62, p = .032$); therefore the results presented are based on the violation of the equal variances assumption. This correction was reported to account for the violation of the equal variance assumption when conducting an independent samples *t*-test to avoid the possibility of making a type I error. A significant difference between the single attempt group ($M = 1.32, SD = 1.02$) and the multiple attempt group ($M = 1.62, SD = 0.77$) was found on the *worst* wish to die/wish to live index, $t(118.7) = -2.40, p = .018$.

The results equate to a small effect size (Cohen's $d = -0.44$). Levene's test for equal variance was significant ($F = 12.57, p < .001$); therefore the results were presented based on a violation of the assumption. Figure 2 presents a graphical representation of the mean scores and error bars for the wish to die/wish to live index-*current* whereas Figure 3 presents a graphical representation of the mean scores and error bars for the wish to die/wish to live index-*worst*.

Psychiatric Characteristics and Suicide Attempt Status (Aim 2)

A logistic regression model (see Table 6) was conducted to determine the baseline psychiatric characteristics that significantly associated with multiple suicide attempt status. Psychiatric characteristics (7 variables in total) served as the independent variables and suicide attempt status (single versus multiple) served as the dependent variable. The model was conducted in two steps with step one including problem substance use and all Axis I diagnostic groups. The second step added indication of BPD traits in order to see how it may change the presentation of Axis I variables. Individuals with multiple suicide attempt status were expected to demonstrate a significantly higher likelihood of receiving the baseline psychiatric diagnoses of mood disorder, non-PTSD anxiety disorder, PTSD, substance use disorder (including problem alcohol and drug use), and an indication of borderline personality disorder traits. Overall, this hypothesis was partially confirmed in that the multiple attempt individuals did present a more severe psychiatric picture with higher rates of Axis I comorbidity, an increased likelihood of problem drug use, and an indication of BPD traits.

The full model for step one containing all of the predictors with the exception of the BPD traits was statistically significant $\chi^2(7) = 23.63, p = .001$. Several of the

independent variables made a unique statistically significant or near significant contribution to the model. Specifically, individuals with problem drug use were 2.19 ($p = .051$) times more likely to have multiple suicide attempts; individuals with an anxiety disorder diagnosis (non-PTSD) or PTSD diagnosis were 1.87 ($p = .050$) and 1.95 ($p = .063$) times respectively more likely to have multiple suicide attempts. Step two of the model, adding an indication of BPD traits, was also statistically significant $\chi^2(8) = 35.54$, $p < .001$. The independent variables now uniquely contributing to the model were problem drug use and an indication of borderline personality disorder traits. Individuals with problem drug use were 2.21 ($p = .049$) times more likely to have multiple suicide attempts and individuals with BPD traits were 3.17 ($p = .001$) times more likely to have multiple suicide attempts. The variables of anxiety disorder (non-PTSD) and PTSD were no longer trending toward significance.

Finally, an additional chi-square analysis (see Table 7) was conducted to examine the relationship between psychiatric comorbidity (number of Axis I diagnoses, 0, 1, 2, 3, 4) and suicide attempt status. Results indicated a significant relationship between the number of Axis I diagnoses and suicide attempt status group $\chi^2(4) = 17.72$, $p = .001$. Individuals with multiple versus single suicide attempts demonstrated a higher proportion of having four Axis I diagnoses (i.e., 47.9% versus 26.2%). Figure 4 presents a graphical representation of the number of Axis I disorders based on suicide attempt group.

Stability of Psychiatric Symptomatology and Suicide Attempt Status (Aim 3)

A random-coefficients approach was used to investigate change within and between individuals via a hierarchical linear modeling (HLM) framework. This approach allows for randomly varying slopes over time, providing additional details on

participants' stability of symptoms over time. The procedures for conducting these multi-level analyses are outlined in Heck, Thomas, and Tabata (2010). Given the possibility that treatment effects may be associated with the observed course of psychiatric symptomatology over time, RCT participants assigned to only the control condition were used in these analyses.

Individuals with multiple suicide attempt status versus single attempt status were expected to demonstrate significantly higher levels of depression, hopelessness, and suicidal ideation at baseline as well as more stability in these three domains from baseline to 1-month and from 1-month to 3-months. Findings as described in depth in the sections below showed that individuals with multiple versus single suicide attempts had a significantly higher baseline level of depression, but not hopelessness or suicide ideation. In terms of the stability hypothesis, depression severity, hopelessness, and *current* suicide ideation did not remain stable over time and in fact, showed similar rates of decrease in both groups. For suicide ideation as experienced during the *worst* point since the last assessment, multiple attempt status individuals compared to their counterparts demonstrated more stability over time and showed generally higher SSI-*worst* scores over time.

The total sample size for this aim was 149 with 30.2% single suicide attempt status individuals ($n = 45$) and 69.8% multiple attempt individuals ($n = 104$). The first step in conducting this aim was to restructure the horizontal dataset (each row represents one participant) into a vertical dataset with time or repeated measures nested within the individuals. Given the three time points (i.e., baseline, 1-month, and 3-months), each participant had three rows within the dataset, one representing each time point. The

second step taken in this process was to examine a subset of individual growth curves for each dependent variable (BDI-II, BHS, SSI [*current* and *worst*]) to determine whether the symptoms change linearly or quadratically over the three time points. Growth curves for the first 17 participants in the dataset for each dependent variable showed a curvilinear line as the best fit for the data for each of the dependent variables. Therefore the decision was made to include a quadratic time variable into each of the models as another within-subjects variable.

The next step in the modeling process was to determine the best fit model based on level 1 and level 2 covariance structures, as well as confirm the appropriate fit for leaving both linear and quadratic time in the models. The level 1 covariance structure represents the error associated with “measuring each individual’s true trajectory (i.e., the difference between the observed and true trajectory)”, (Heck et al., 2010; pp.162). The level 1 covariance structures tested for model fitting, based on structures commonly used in longitudinal analyses, were identity, compound symmetry, diagonal, and autoregressive. An identity structure assumes the error on each occasion is independent and has constant variance. A compound symmetry structure assumes the variance in error will be the same at each occasion and the covariance across occasions will be the same. A diagonal structure allows for different variances at each occasion, but assumes there is no covariance between occasions. Finally, an autoregressive structure assumes that the error within individuals is correlated, but is different across individuals. Level 2 covariance structures were used to examine the error in regard to the random effects (randomly varying intercept and slope, in this case). An unstructured matrix allows for

separate variances and separate covariances between variables and was used as the level 2 structure in all models.

To determine the best covariance structure, all listed covariance structures above were tested with each of the dependent variables. Each dependent variable was separately evaluated in a model with only time and quadratic time (within-subjects variables) as covariates. The models were comprised of fixed effects (intercept and slope), as well as random effects (intercept and slope). After running each combination of covariance structures for each dependent variable, the models with the lowest Akaike information criteria (AIC), commonly used as an indicator of the best fit model (Marcoulides & Hershberger, 1997) were selected to test the hypotheses specific to this aim. The final step in the modeling process was to add suicide attempt status to the model as a covariate and compare the two groups (single versus multiple) on estimates of the rate of change of the dependent variable and whether the variable accelerated or decelerated over time. Details of the specific model fitting structures and results for each dependent variable are discussed below.

Depression. After testing the different covariance structures at Level 1 and Level 2 (as listed above) with depression severity (BDI-II) as the dependent variable, the best fit model based on the lowest AIC was selected. With an AIC of 2911.56, the model with an identity structure at level 1 and unstructured matrix at level 2 was selected for the analysis. The final model run for depression severity investigated estimations of between group differences (single versus multiple suicide attempt status) based on a fixed intercept and slope, as well as randomly varying intercept and slope.

The results of the fixed effects indicated an initial BDI-II score for single suicide attempt status individuals as $\beta = 24.54$. Main effects were found for time, $t(214.21) = -5.17, p < .001$; quadratic time, $t(121.26) = 3.63, p < .001$; and suicide attempt status, $t(174.83) = 4.17, p < .001$. These results indicate that BDI-II scores decrease on average by approximately 10 points per time period ($\beta = -10.03$) and the decrease in scores or slope, slows over time (Quadratic Time $\beta = 2.88$). Additionally, multiple suicide attempt status individuals were estimated to have a baseline BDI-II score of 33.71 or 9.17 points higher than the single suicide attempt status individuals ($\beta = 9.17$). The time by suicide attempt status interaction was not significant, $t(137.20) = -1.63, p = .106$.

Table 8 presents a summary of the fixed effects for depression severity as predicted by suicide attempt status. Figure 5 presents a graphical representation of the mean BDI-II scores for both single and multiple suicide attempt individuals over time. In interpreting the random effects, results confirm that initial intercepts (Wald $Z = 6.15, p < .001$) and slopes (Wald $Z = 3.31, p = .001$) vary across individuals. Additionally, a trend was found signifying a negative relationship between initial intercept and growth rate (Wald $Z = -17.82, p = .061$), interpreted as individuals with higher initial depression scores were likely to show more decrease in symptoms over time.

Hopelessness. After testing the different covariance structures at Level 1 and Level 2 (as listed above) with level of hopelessness (BHS) as the dependent variable, the best fit model based on the lowest AIC was selected. With an AIC of 2361.03, the model with an identity structure at level 1 and unstructured matrix at level 2 was selected for the analysis. The final model run for level of hopelessness investigated estimations of

between group differences (single versus multiple suicide attempt status) based on a fixed intercept and slope, as well as randomly varying intercept and slope.

The results of the fixed effects indicated an initial BHS score for single suicide attempt status individuals as $\beta = 10.49$. Main effects were found for time, $t(204.24) = -3.48, p < .001$ and quadratic time, $t(121.99) = 2.94, p = .001$. These results indicate that BHS scores decrease on average by approximately 3.5 points per time period ($\beta = -3.56$) and the decrease in scores or slope, slows over time (Quadratic Time $\beta = 1.26$). There was no significant main effect for suicide attempt status, $t(168.69) = 1.47, p = .143$ or a significant time by suicide attempt status interaction, $t(138.90) = -0.59, p = .558$. Table 9 presents a summary of the fixed effects for hopelessness as predicted by suicide attempt status. Figure 6 presents a graphical representation of the mean BHS scores for both single and multiple suicide attempt individuals over time. In interpreting the random effects, results confirm that initial intercepts (Wald $Z = 5.46, p < .001$) and slopes (Wald $Z = 2.69, p = .007$) vary across individuals. A statistically significant relationship between initial intercept and growth rate was not found (Wald $Z = -1.43, p = .152$).

Suicidal ideation-current. After testing the different covariance structures at Level 1 and Level 2 (as listed above) with level of suicidal ideation-current (SSI-current) as the dependent variable, the best fit model based on the lowest AIC was selected. With an AIC of 2682.29, the model with an autoregressive structure at level 1 and unstructured matrix at level 2 was selected for the analysis. The final model run for level of suicidal ideation-current investigated estimations of between group differences (single versus multiple suicide attempt status) based on a fixed intercept and slope, as well as randomly varying intercept and slope.

The results of the fixed effects estimate an initial SSI-*current* score for single suicide attempt status individuals as $\beta = 10.87$. Main effects were found for time, $t(189.75) = -6.48, p < .001$ and quadratic time, $t(112.65) = 5.20, p < .001$. These results indicate that SSI-*current* scores decrease on average by approximately 11 points per time period ($\beta = -11.13$) and the decrease in scores or slope, slows over time (Quadratic Time $\beta = 3.85$). There was not a significant main effect for suicide attempt status, $t(152.80) = 1.25, p = .214$ or a significant time by suicide attempt status interaction, $t(142.14) = -1.45, p = .151$. Table 10 presents a summary of the fixed effects for level of suicidal ideation-*current* as predicted by suicide attempt status. Figure 7 presents a graphical representation of the mean SSI-*current* scores for both single and multiple suicide attempt individuals over time. In interpreting the random effects, results confirm that initial intercepts (Wald $Z = 6.57, p < .001$) and slopes (Wald $Z = 2.99, p = .003$) vary across individuals. Additionally, a significant negative relationship between initial intercept and growth rate was found (Wald $Z = -4.61, p < .001$), in that individuals with higher initial scores of suicidal ideation were likely to show more decrease in symptoms over time.

Suicidal ideation-*worst*. After testing the different covariance structures at Level 1 and Level 2 (as listed above) with level of suicidal ideation-*worst* (SSI-*worst*) as the dependent variable, the best fit model based on the lowest AIC was selected. With an AIC of 2789.03, the model with a diagonal structure at level 1 and unstructured matrix at level 2 was selected for the analysis. The final model run for level of suicidal ideation-*worst* investigated estimations of between group differences (single versus multiple

suicide attempt status) based on a fixed intercept and slope, as well as randomly varying intercept and slope.

The results of the fixed effects estimate an initial SSI-*worst* score based on lifetime for single suicide attempt status individuals as $\beta = 27.46$. Main effects were found for time, $t(165.52) = -13.71, p < .001$ and quadratic time, $t(165.52) = -13.71, p < .001$. These results indicate that SSI-*worst* scores decrease on average by approximately 28 points per time period ($\beta = -27.77$) when first assessed for worst in lifetime to worst since the last assessment and the decrease in scores or slope, slows over time (Quadratic Time $\beta = 8.92$). There was not a significant main effect for suicide attempt status, $t(148.99) = -0.18, p = .857$; however there was a significant time by suicide attempt status interaction, $t(136.00) = 2.66, p = .009$. This result can be interpreted as individuals with a single suicide attempt will have decreasing SSI-*worst* scores averaging 28 points per time period where multiple suicide attempt status individuals will only have decreasing scores averaging 24 points per time period ($\beta = 3.47$). Table 11 presents a summary of the fixed effects for level of suicidal ideation-*worst* as predicted by suicide attempt status. Figure 8 presents a graphical representation of the mean SSI-*worst* scores for both single and multiple suicide attempt individuals over time. In interpreting the random effects, results confirm that initial intercepts (Wald $Z = 2.11, p = .034$) and slopes (Wald $Z = 2.79, p = .005$) vary across individuals. A significant relationship between initial intercept and growth rate was not found (Wald $Z = -1.22, p = .224$).

Comparison of Military Personnel and Civilians with Multiple Suicide Attempts on Psychiatric Characteristics (Aim 4)

The final aim of this study was to identify the baseline psychiatric characteristics that significantly differentiate military versus civilian participants with multiple suicide attempt status. The total sample size for this aim was 214 with 87.9% ($n = 188$) of the sample civilian and 12.1% ($n = 26$) military. One participant in the USUHS sample with multiple suicide attempts was a military dependent and was therefore, removed from these analyses. Prior to hypothesis testing, chi-square analyses were conducted to determine if relationships exist between military and civilian status and all demographic variables, with the exception of age, to determine appropriate covariates for the remaining analyses. Military and civilian participants did not show statistically significant frequency differences based on sex, $\chi^2(1) = 1.26, p = .261$; however all remaining demographic variables were significantly related to military status.

More specifically, civilian participants primarily consisted of African-Americans (57.5%) while military participants primarily consisted of Caucasians, $\chi^2(2) = 12.48, p = .002$. Half of the civilian sample was never married (50.8%) and almost half of the military sample was married (43.5%), $\chi^2(2) = 6.63, p = .036$. Additionally, the groups differed educationally in that the civilian group had more than one third with less than a high school education (37.0%) and the military group had more than a third with some college (39.1%), $\chi^2(4) = 27.29, p < .001$. Table 12 presents a summary of frequencies for each demographic variable. A t-test was conducted to examine the relationship between military/civilian status and age. Results indicate a significant relationship between civilian status ($M = 36.10, SD = 9.28$) and military status ($M = 29.12, SD =$

8.96), $t(210) = 3.61, p < .001$, based on age. Ethnicity, marital status, and education were then collapsed to form variables with only two levels per variable due to the small overall sample size, to maintain a stable logistic regression model. Ethnicity was collapsed to Caucasian/Non-Caucasian. Marital status was collapsed to married/not married and education was collapsed to high school or less/some college or more. Age remained a continuous variable.

Given the small sample size of the military group ($n = 26$), the data analytic strategy for this aim was to first conduct a series of independent bivariate analyses in order to increase the stability of the logistic regression model and to avoid over-fitting by excluding any non-significant variables. It was hypothesized that military status would be associated with PTSD, substance use disorders, and problem substance use, while civilian status would be associated with mood disorder, non-PTSD anxiety disorder, and indication of BPD traits. For all bivariate analyses, military status (Military/Civilian) was analyzed in chi-square analyses with the following variables separately (1) mood disorder (Yes/No); (2) non-PTSD anxiety disorder (Yes/No); (3) PTSD (Yes/No); (4) substance use disorder (Yes/No); (5) other Axis I disorder (Yes/No); (6) problem alcohol use (Yes/No); (7) problem drug use (Yes/No); and (8) indication of BPD traits (Yes/No). The civilian status and military status groups do not have statistically significant frequency differences based on mood disorder, PTSD, other Axis I disorders, or indication of BPD traits. Results from the chi-square analyses revealed the civilian multiple attempt group had a higher frequency of problem alcohol use, $\chi^2(1) = 11.10, p = .001$; problem drug use, $\chi^2(1) = 77.75, p < .001$; and substance use disorder, $\chi^2(1) = 27.48, p < .001$ compared to the military group. The military multiple suicide attempt

group had a higher frequency of non-PTSD anxiety disorder, $\chi^2(1) = 19.77, p < .001$, compared to the civilian group. Table 13 presents a summary of frequencies for each psychiatric variable.

All variables in the bivariate analyses resulting in a significant p-value less than or equal to .10, (problem alcohol use, substance use disorder, non-PTSD anxiety disorder) with the exception of problem drug use, were then entered into a logistic regression model. Problem drug use was excluded from the logistic regression model because there were no military individuals meeting criteria for problem drug use, making the model unstable and therefore, unable to reach a solution. Additionally, the previously identified demographic covariates of age, ethnicity, marital status, and education were also entered into the model, making 7 independent variables in total. The overall logistic regression model was significant, $\chi^2(7) = 59.07, p < .001$. All of the demographic covariates uniquely contributed to the model at a statistically significant level, confirming the chi-square and t-test analyses. Of the independent variables hypothesized to be associated with military status, a substance disorder diagnosis was not significant ($p = .165$). Non-PTSD anxiety disorder was a unique contributor to the model in that individuals in this sample with a non-PTSD anxiety disorder diagnosis were three and half times more likely to be of military status compared to civilian status ($OR = 3.59, p = .032$). Additionally, though not significant at the $p = .05$ level, problem alcohol use was associated with civilian status ($OR = 0.31, p = .069$). Table 14 presents a summary of logistic regression analysis for psychiatric variables predicting military status.

To further elucidate the finding that individuals with multiple suicide attempts having a non-PTSD anxiety disorder diagnosis are three and a half times more likely to

be military members vice civilians, additional diagnosis details are provided. Of the military sample ($n = 26$), more than half of the sample (65.4%) had a diagnosis of Generalized Anxiety Disorder, compared to only 3.7% of the civilian sample and over one third of the military sample met criteria for Agoraphobia without a history of Panic Disorder (34.6%), compared to zero civilians. Table 15 presents a summary of the specific anxiety disorder frequencies within the military and civilian sample.

Given the overall purpose of this aim, to determine if military multiple suicide attempt status individuals have a different psychiatric picture than civilians, an additional chi-square analysis was conducted to examine psychiatric comorbidity. The number of Axis I diagnoses (0, 1, 2, 3, 4) was analyzed with military status (Military/Civilian). Results do not support a significant relationship between the number of Axis I diagnoses and military status $\chi^2(3) = 5.89, p = .117$. Table 16 presents a summary of frequencies of number of Axis I disorders.

Overall, the hypotheses associated with this aim were not confirmed. Although non-PTSD anxiety disorder and problem alcohol use did differ between the civilian and military multiple suicide attempt status individuals, the differences were in the opposite direction from the prediction. Specifically, the hypotheses were for military individuals to have higher rates of problem substance use and civilians to have higher rates of non-PTSD anxiety disorders. Additionally, it was hypothesized for differences between groups to emerge on the remaining psychiatric variables; however, those hypotheses were not confirmed for any other psychiatric variable. An additional analysis was performed to investigate the differences between military and civilians in regard to psychiatric

comorbidity and these results did not support civilians having higher rates of comorbidity compared to the military members.

Exploratory Analyses

Stability of wish to die/wish to live index-*current* and suicide attempt status.

An exploratory set of analyses were conducted in the same manner as the other dependent variables described under Aim 3 analyses in the modeling process. Similar to other dependent variables, a curvilinear line was the best fit for the data. After testing the different covariance structures at Level 1 and Level 2 (as listed above) with *current* wish to die/wish to live index (WDWL-*current*) as the dependent variable, the best fit model based on the lowest AIC was selected. With an AIC of 1216.05, the model with an autoregressive structure at level 1 and unstructured matrix at level 2 was selected for the analysis. The final model run for wish to die/wish to live index scores investigated estimations of between group differences (single versus multiple suicide attempt status) based on a fixed intercept and slope, as well as randomly varying intercept and slope.

The results of the fixed effects indicated an initial WDWL-*current* score for single suicide attempt status individuals as $\beta = -0.35$. This estimate indicates that at baseline, the single attempt group had a slightly stronger wish to live than wish to die; however, this estimate is only trending toward significance with $p = .103$, slightly reducing the confidence of this value. Main effects were found for time, $t(182.77) = -4.79, p < .001$ and quadratic time, $t(120.63) = 3.64, p < .001$. These results indicate that WDWL-*current* scores decrease (become more negative, indicating a stronger wish to live) on average by approximately 1 point per time period ($\beta = -1.23$) and the decrease in scores or slope, slows over time (Quadratic Time $\beta = 0.42$). There was not a significant

main effect for suicide attempt status, $t(157.53) = 0.98, p = .331$ or for a time by suicide attempt status interaction, $t(138.12) = -1.04, p = .300$.

Table 17 presents a summary of the fixed effects for wish to die/wish to live index-*current* as predicted by suicide attempt status. Figure 9 presents a graphical representation of the mean WDWL-*current* scores for both single and multiple suicide attempt individuals over time. In interpreting the random effects, results confirm that initial intercepts (Wald $Z = 2.55, p = .011$) vary across individuals; though slopes (Wald $Z = 0.71, p = .481$) do not appear to vary across individuals. Additionally, a trending toward significant negative relationship between initial intercept and growth rate was found (Wald $Z = -0.41, p = .069$), in that individuals with higher initial scores of wish to die/wish to live index (stronger wish to die) were likely to show more decrease in symptoms over time. In summary, for *current* wish to die/wish to live index scores, no predictions were made. Results indicate that single and multiple attempt status individuals had a moderate wish to live at baseline and that wish to live grew stronger over time.

Stability of wish to die/wish to live index-*worst* and suicide attempt status.

An exploratory set of analyses were conducted in the same manner as the other dependent variables described above under Aim 3 analyses in the modeling process. Similar to other dependent variables, a curvilinear line was the best fit for the data. After testing the different covariance structures at Level 1 and Level 2 (as listed above) with the *worst* wish to die/wish to live index (WDWL-*worst*) as the dependent variable, the best fit model based on the lowest AIC was selected. With an AIC of 1164.28, the model with a diagonal structure at level 1 and unstructured matrix at level 2 was selected for the

analysis. The final model run for *worst* wish to die/wish to live index scores investigated estimations of between group differences (single versus multiple suicide attempt status) based on a fixed intercept and slope, as well as randomly varying intercept and slope.

The results of the fixed effects indicated an initial WDWL-*worst* score based on lifetime for single suicide attempt status individuals as β 1.46. This estimate showed that at baseline, the single attempt group had a moderately stronger wish to die than wish to live. Main effects were found for time, $t(154.00) = -10.00, p < .001$ and quadratic time, $t(111.35) = 7.28, p < .001$. These results indicate that WDWL-*worst* scores decrease (become more negative, indicating a stronger wish to live) on average by nearly 3 points per time period ($\beta = -2.89$) when first assessed for worst in lifetime to worst since the last assessment and the decrease in scores or slope, slows over time (Quadratic Time $\beta = 0.92$). There was not a significant main effect for suicide attempt status, $t(147.37) = 0.34, p = .735$; however there was a significant time by suicide attempt status interaction, $t(131.67) = 2.11, p = .036$. This interaction can be interpreted as single suicide attempt individuals will have a decreasing WDWL-*worst* score averaging 2.89 points per time period, while multiple suicide attempt individuals will decrease their scores approximately 2.5 points per time period ($\beta = 0.36$).

Table 18 presents a summary of the fixed effects for wish to die/wish to live index-*worst* as predicted by suicide attempt status. Figure 10 presents a graphical representation of the mean WDWL-*worst* scores for both single and multiple suicide attempt individuals over time. In interpreting the random effects, results confirm that slopes (Wald $Z = 3.57, p < .001$) vary across individuals; though initial intercepts (Wald $Z = 1.43, p = .1531$) do not appear to vary across individuals. A significant relationship

between initial intercept and growth rate was not found (Wald $Z = -1.07$, $p = .286$). In summary, for wish to die/wish to live index scores-*worst*, no predictions were made. Results indicate that both single and multiple attempt status individuals reported a moderate wish to die when they were feeling their worst. However, individuals with multiple suicide attempt status versus single attempt status showed more stability over time. In other words, multiple attempt individuals' wish to die did not decrease as much over time as did the single attempt individuals.

Repeat suicide attempts. As stated previously, there were 7 participants that were classified as single attempt status individuals at baseline and subsequently made another suicide attempt during the course of the study. Additionally, there were 36 individuals classified as multiple attempt status that made another suicide attempt during the course of the study. Statistical tests were not used for this exploratory series of analyses. Instead, only the means of the groups and line graphs depicting mean symptom level at each time point were examined. This decision was made due to the small number of participants in the repeat attempt groups and the severely underpowered analyses, making the risk of making a Type II error in regard to treatment effects too great. Figures 11 through 16 provide graphical representation of the data. Specifically, line graphs are provided which depict estimated marginal means for depression severity, level of hopelessness, *current* suicidal ideation, suicidal ideation *worst*, wish to die/wish to live index-*current*, and wish to die/wish to live index-*worst*, respectively. The symptoms are separated by group (single attempt/single repeat/multiple attempt/multiple repeat) and displayed over the three time points. Table 19 provides specific mean and standard deviation information for each group at each time point for each symptom-level variable.

For depression severity, it appears that all groups show a decrease in depression scores over time, with the single no repeat attempt group maintaining the lowest scores or less severe depression at each time point (Figure 11). For level of hopelessness, the single attempt, multiple attempt, and multiple repeat groups all showed a significant decrease from baseline to 1-month, and then nearly leveled out to the 3-month follow-up, whereas the single repeat group had a pattern of a “V”, starting with high hopelessness scores, dropping drastically at the 1-month and then increasing drastically again at the 3-month follow-up. The multiple attempt and multiple repeat groups generally had the highest hopelessness scores (Figure 12).

Looking at the graph for *current* suicidal ideation, all groups appear to have a sharp decrease between the first two follow-ups and then a less severe decrease from the 1-month follow-up to the 3-month. The single repeat and multiple repeat groups, while sharing this pattern, remained slightly higher in suicidal ideation at each follow-up time point (Figure 13). The suicidal ideation-*worst* indicates a different pattern. The single attempt and multiple attempt groups had similar patterns as the *current* suicidal ideation. Their *worst* ideation scores dropped significantly between baseline and 1-month and then leveled out to the 3-month. The individuals who started as single attempt and made a repeat suicide attempt only had a modest drop in ideation from baseline to 1-month and another modest drop to the 3-month and the multiple repeat individuals actually increased from 1-month to 3-months. Again, the repeat attempt groups maintained higher levels of *worst* suicidal ideation at the follow-up time points (Figure 14).

In regard to *current* wish to die/wish to live index scores, all groups reported a stronger wish to live at all three time points, but the multiple attempt group started in a

more ambivalent state and then their wish to live increased drastically at the 1-month follow-up. The single and multiple repeat attempt groups showed the least improvement in their wish to live over the follow-up time points and the single attempt group showed the strongest wish to live at all three times (Figure 15). The graphical representation of the wish to die/wish to live index-*worst* implies differences between the four groups. All groups started with moderate wishes to die, but where the single and multiple no repeat attempt groups reported moderate levels wishing to live at the 1-month follow-up, the single and multiple repeat attempt groups maintained moderately strong wishes to die. In fact, for WDWL-*worst*, the repeat attempt groups had stronger wishes to die at all three time points and the non-repeat attempt groups had wishes to live at 1-month and 3-months (Figure 16).

Overall, the information presented in the context of these exploratory analyses should be interpreted with caution given the small and unequal sample sizes. Several interesting observations can be highlighted and considered for conceptualization of future research efforts. First, it appears the individuals in the multiple no repeat group and the individuals in both repeat groups maintained moderate to severe levels of depression. Individuals who made repeat suicide attempts (whether starting as single or multiple attempt status) maintained higher levels of symptoms (with the exception of hopelessness) over time compared to those who did not make another suicide attempt. These between group differences appeared to be the largest for suicidal ideation-*worst* and wish to die/wish to live index-*worst*. The graphical representation of this data seems to shed light on the earlier HLM findings in that it may be the individuals who are

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making ongoing suicide attempts that bring up the mean level of symptoms for suicidal ideation-*worst* and wish to die/wish to live index-*worst*.

Section VII. Discussion

The objectives of this dissertation study were threefold: (1) to confirm that individuals with multiple versus a single suicide attempt exhibit a more severe clinical picture; (2) to determine if multiple versus single suicide attempt individuals sustain a more severe clinical picture over time; and (3) to evaluate potential differences between civilian and military individuals with multiple suicide attempts. Study findings demonstrate that multiple versus single suicide attempt status individuals present with a more severe clinical picture, under certain circumstances sustain a more severe clinical picture over time, and present differently psychiatrically based on military versus civilian status. In the sections below, specific findings will first be discussed in conjunction with relevant research, followed by the clinical implications of these findings. The limitations and strengths of this study will then be detailed and followed by recommendations for future research and policy considerations.

Wish to Die/Wish to Live Index and Suicide Attempt Status (Aim 1)

While depression, suicidal ideation, and hopelessness have all been identified as risk factors for eventual death by suicide (CDC, 2010) and there have been several cross-sectional studies to demonstrate that multiple suicide attempt individuals have higher rates of these risk factors compared with single suicide attempt status individuals (e.g., Forman et al., 2004; Rudd et al., 1996), much remains unknown about the wish to die/wish to live index which indirectly also captures a suicidal person's ambivalence

level. For this study, individuals with multiple suicide attempt status were expected to show a significantly higher baseline wish to die/wish to live index (i.e., a stronger wish to die) – both for *current* and *worst* (lifetime) times. In both types of measurement, individuals with a multiple attempt versus a single attempt showed a relatively stronger wish to die or a relatively weaker wish to live.

To date, the wish to die/wish to live index has been identified by one prospective study as an independent predictor of suicide (Brown et al., 2005). Most recently, O'Connor and colleagues (2012) used discriminate function analysis to investigate possible suicide typologies for three groups: (1) wish to die; (2) ambivalent; and (3) wish to live. The groups were determined by using a wish to die/wish to live index score ranging from -6 to +6. Results indicated that the three typologies significantly differed based on suicide attempt history with the wish to die typology having a higher percentage of individuals with multiple suicide attempts versus single suicide attempts and ideation. The participants were all psychiatric inpatients assessed within 48 hours of their hospital admission. Therefore, there is some indication for multiple suicide attempt status individuals having a higher wish to die/wish to live index shortly after a hospitalization.

The internal struggle hypothesis of suicidal behavior, posed by Kovacs and Beck (1977), argued that suicidal individuals may struggle with having both a desire to live and a desire to die. They found about half the sample to be ambivalent and those with stronger wishes to die were associated with more suicidal intent. More recent work by Brown and colleagues (2005) found that having a stronger wish to die compared to wish to live put an individual at greater risk for eventually dying by suicide. Given the results of the current study, it may be that multiple attempt individuals having higher wish to

die/wish to live index scores puts them at greater risk for dying by suicide, though additional research is needed to confirm this prediction. Additionally, the wish to die/wish to live index may be useful for suicide risk assessment and treatment as discussed in the clinical implications section below.

Psychiatric Characteristics and Suicide Attempt Status (Aim 2)

Individuals with multiple suicide attempt status were expected to demonstrate a significantly higher likelihood of receiving the baseline psychiatric diagnoses of mood disorder, anxiety disorder (non-PTSD as well as PTSD), substance use disorder (including problem alcohol and drug use), and an indication of borderline personality disorder traits. Overall, this hypothesis was partially confirmed in that the multiple attempt individuals did present a more severe psychiatric picture with higher rates of Axis I comorbidity, an increased likelihood of problem drug use, and an indication of BPD traits. Specifically, multiple versus single attempt status individuals were more likely to have four Axis I disorders, two times more likely to have problem drug use, and over three times more likely to have an indication of BPD traits.

There is support in the scientific literature to indicate that multiple versus single suicide attempt status individuals have a more severe psychological picture, including more psychiatric diagnoses in both civilian and military samples (Forman et al., 2004; Miranda et al., 2008; Osváth et al., 2003; Rudd et al., 1996). Moreover, this study's findings associated with problem drug use are in line with the civilian literature (Kaslow et al., 2006; Reynolds & Eaton, 1986; Stephens, 1987). However, problem drug use was not found as a distinguishing factor in military studies (Kochanski, 2012; Rudd et al., 1996). One likely explanation is related to the methodology used in the prior studies.

Kochanski (2012) utilized a retrospective chart review methodology, which would require problem drug use to be documented in their military medical record as opposed to be assessed by an outside researcher with clinical interview. Rudd and colleagues (1996) excluded individuals determined by clinical evaluation to require independent substance use treatment so it is plausible that these two studies were not designed to adequately capture drug use in military samples. Another possible explanation for this discrepancy may be related to the lack of a systematic screening for drug use within military inpatient settings due to the general military policy against drug use and the legal as well as career-related implications associated with drug use. Within this dissertation study, civilian participants disproportionately outnumbered military participants, making it not surprising to still find problem drug use as a significant predictor. In addition to Axis I comorbidity and problem drug use, an indication of BPD traits was associated with multiple suicide attempt status. In the scientific literature, personality disorders have consistently been related to multiple suicide attempt status individuals (Gupta et al., 1992; Osváth et al., 2003), with BPD recognized as the most common (Boisseau et al., in press; Forman et al., 2004; Rudd et al., 1996).

Interestingly, anxiety disorders (non-PTSD as well as PTSD diagnoses) in our sample did not reach significance in regression analyses once BPD was added to the model. While several studies have found anxiety disorders to be related to multiple attempt status (Lopez-Castroman et al., 2011; Miranda et al., 2008; Rudd et al., 1996), none of these studies have controlled for BPD in analyses. This noted difference in statistical adjustment may explain the differences reported in this dissertation versus prior research. There is some evidence to suggest that individuals with BPD may be highly

anxious and that overall, anxiety and BPD may commonly co-occur. Benjamin, Silk, Lohr, and Western (1989) found that individuals with BPD were more likely to have a comorbid anxiety disorder compared to individuals with a depressive disorder and Gratz, Tull, and Gunderson (2008) found that individuals with BPD had high rates of anxiety sensitivity. Also, Andover, Pepper, Ryabchenko, Orrico, and Gibb (2005) provide evidence to indicate that when a person is diagnosed with BPD, their anxiety symptoms are no longer a significant distinguishing variable. Taken together, it seems that having an indication of BPD traits overshadows the significance of anxiety disorders in distinguishing single versus multiple suicide attempt status. Similarly, PTSD and BPD commonly occur together with symptoms of cumulative trauma often in line with symptoms of BPD (Pearlman & Courtois, 2005) and in general, the symptoms of PTSD could be confused as symptoms of BPD when extensive clinical interviews are not used for determination. The commonality between symptoms may explain why PTSD no longer remained as a significant between group predictor when an indication of BPD traits was in the regression model.

There are a number of other psychiatric diagnoses hypothesized to be related to multiple suicide attempt status that were not found to be significant predictors in the model – i.e., mood disorders, substance use disorders, and problem alcohol use. Mood disorders as a possible distinguishing variable for single versus multiple suicide attempt individuals has had mixed support. Osvath and colleagues (2003), as well as Kochanski (2012) found a mood disorder diagnosis to be related to multiple attempt status but other studies had null findings (Miranda et al., 2008; Rudd et al., 1996). These mixed results may indicate that mood disorder is not a distinguishing variable, that it may interact with

other psychiatric conditions, or simply show a different role depending on the study sample and methodology. For instance, the majority of participants in this study were hospitalized in a psychiatric inpatient unit; therefore a very large percentage of the entire sample (89%) met criteria for a mood disorder, not allowing for much heterogeneity. An outpatient sample may show more variability in regards to the presence or absence of a mood disorder diagnosis.

The null findings for substance use disorders and problem alcohol use was surprising given the positive finding for problem drug use and the frequency of which these variables distinguished the groups in other studies (Kaslow et al., 2006; Kochanski, 2012; Osváth et al., 2003; Reynolds & Eaton, 1986; Rudd et al., 1996); however, all of these studies with the exception of one, only conducted univariate analyses. Kochanski (2012), based on a retrospective chart review study (compared to diagnostic interviews used in other studies) found, through multivariate analyses, that males with multiple suicide attempts were more likely to have problem substance use. The present study did not find differences in problem alcohol use or substance use disorders, but this was when controlling for all other psychiatric variables. Post-hoc univariate chi-square analyses confirmed multiple attempt status individuals were more likely to have a substance use disorder and problem alcohol use, however it seems that when considering other psychiatric variables, such as problem drug use and an indication of BPD traits, alcohol and substance use diagnoses are no longer relevant to distinguish the groups.

Overall, when considering the psychiatric disorder differences between single and multiple suicide attempt status individuals, the *specific* Axis I disorders may not be as significant in understanding the between-group differences as the total number of

diagnoses and thus, comorbidity. This study found that multiple attempt individuals were more likely to have four Axis I diagnoses and similar results have been confirmed in several other studies (Forman et al., 2004; Miranda et al., 2008; Osváth et al., 2003; Rudd et al., 1996). It also appears that having an indication of BPD traits or a BPD diagnosis is particularly salient to individuals with multiple suicide attempts (Boisseau et al., in press; Forman et al., 2004; Rudd et al., 1996).

Stability of Psychiatric Symptomatology and Suicide Attempt Status (Aim 3)

Individuals with multiple suicide attempt status versus single attempt status were expected to demonstrate significantly higher levels of depression, hopelessness, and suicidal ideation at baseline as well as more stability in these three domains from baseline to 1-month and from 1-month to 3-months. Individuals with multiple versus single suicide attempts were found to have a significantly higher baseline level of depression only. In terms of the stability hypothesis, depression severity, hopelessness, and *current* suicide ideation did not remain stable over time and in fact, showed similar rates of decrease in both groups. For suicide ideation as experienced during the *worst* point, when first assessed for worst in lifetime to worst since the last assessment, multiple attempt status individuals compared to their counterparts demonstrated more stability over time and showed generally higher SSI-*worst* scores over time.

The significant between-group differences in depression severity is in line with other cross-sectional studies (Filinto da Silva Cais et al., 2009; Forman et al., 2004; Reynolds & Eaton, 1986; Rudd et al., 1996) which have demonstrated that multiple versus single attempt individuals report more severe depression. Multiple attempt individuals have also been shown to have higher baseline scores of hopelessness (Filinto

da Silva Cais et al., 2009; Forman et al., 2004; Kaslow et al., 2006; Rudd et al., 1996) and suicidal ideation (Filinto da Silva Cais et al., 2009; Forman et al., 2004). The null baseline findings in this study were likely due to this aim being underpowered to detect a small effect size. To avoid the possibility of treatment effects impacting the results, this aim was conducted with only participants assigned to the control condition. Post-hoc independent samples exploratory t-tests with the entire sample confirmed that the multiple versus single suicide attempt group had significantly higher suicidal ideation and hopelessness at baseline. With a small effect size detected, such observed differences would not have been detectable in the models using only the control sample and thus a smaller sample size.

All symptom variables were found to decrease over time. It is not entirely surprising to see some decrease in symptoms over time given the high level of reported symptom severity, making some regression to the mean likely (Barnett, van der Pols, & Dobson, 2005). Additionally, for the vast majority of participants, the acute suicidal crisis had passed, likely decreasing their overall distress level. The unique hypotheses for this study were that multiple attempt individuals would maintain more stability in their symptoms over time, i.e., they tend to repeat suicide attempts because they maintain high levels of depression, hopelessness, suicidal ideation, and wish to die. For most symptom variables (depression, *current* suicidal ideation, *current* wish to die), this study did not support the hypotheses. There is only a single study to our knowledge which touches on this specific topic. Walker, Joiner, and Rudd (2001) found that multiple attempt status individuals had higher levels of *current* suicidal ideation at 6-months after a suicide attempt when compared to a combined ideator/single attempt group. Given the combined

ideator/attempt group, it cannot be concluded that multiple attempt individuals maintain more stability in symptoms compared to single attempt individuals.

To our knowledge, there is no other research specifically addressing this topic to support or refute the null finding. It could simply be that current symptom severity reports do not distinguish multiple attempt status individuals from single attempt individuals when examining the stability over time. This inability to distinguish the groups based on these symptoms may actually be due to instability of symptoms over time. For example, given the increased prevalence of multiple attempt individuals having BPD traits or disorder, a diagnosis marked by emotional instability, it could be that individual variability in symptoms over time is too great to assess in this manner. Additionally, a high percentage of the multiple attempt group had problem drug use, another factor that could contribute to instability of symptoms and/or impulsivity. Another explanation is it could be that only a small effect size exists and was undetected due to the lower power of this aim.

In comparison with the null findings noted already, this research study supports between-group differences in stability for suicidal ideation-*worst* and wish to die/wish to live-*worst* (while similar differences were not observed for responses pertaining to *current* ideation and wish to die/wish to live). In other words, when multiple suicide-attempt participants were asked about their level of suicidal ideation or their wish to die at follow-up, they tended to report less suicide ideation and a stronger wish to live (similar to their single suicide attempt counterparts). However, when asked about how their suicidal ideation and wish to die was on the day they were the most depressed since the last assessment period, multiple suicide attempt participants reported higher suicide

ideation and a stronger wish to die. These variables differentiated the multiple suicide attempt individuals from the single attempt individuals over time. On their worst day since the last assessment period, multiple attempt individuals had more suicidal ideation and stronger wish to die than single attempt individuals.

Perhaps a key distinction between single attempt individuals and multiple attempt individuals is related specifically to their moments of distress. This theory is in line with some related single versus multiple suicide attempt research. Reynolds and Eaton (1986) reported that multiple versus single suicide attempt individuals have poorer coping. Other studies have found that multiple versus single suicide attempt individuals have more psychological distress (Kaslow et al., 2006) and poorer problem solving (Forman et al., 2004). Taken together, it could mean that multiple suicide attempt status individuals may have lower distress tolerance and fewer resources to cope with stressors. These findings could have important clinical implications in terms of both risk assessment and treatment considerations, to be discussed in a later section. Another possibility is that the multiple attempt individuals may be recalling their worst day differently than the single attempt individuals. Specifically, there is evidence to suggest that depressed individuals tend to have negative attentional bias, primarily focusing on and remembering negative things (Hooley & Gotlib, 2000). Additionally, hopelessness and suicidality have been related to problems with recalling autobiographical memories such that suicidal individuals may only be able to recall the general emotion as opposed to any specific details of the event (e.g., Arie, Apter, Orbach, Yefet, & Zalzman, 2008). It may, therefore, indicate that multiple attempt individuals may simply be focusing on or remembering things as worse than they were at the time of the experience.

Comparison of Military Personnel and Civilians with Multiple Suicide Attempts on Psychiatric Characteristics (Aim 4)

The final aim of this study was to identify the baseline psychiatric characteristics that significantly differentiated military versus civilian participants with multiple suicide attempt status. Military status was hypothesized to associate with PTSD, substance use disorders, and problem substance use whereas civilian status was hypothesized to associate with mood disorder, non-PTSD anxiety disorder, and indication of BPD traits. The civilian status and military status groups did not show statistically significant frequency differences based on mood disorder, PTSD, other Axis I disorders, or indication of BPD traits. Contrary to expectations, civilian versus military multiple suicide attempt group had a significantly higher frequency of problem alcohol use (trend only) and problem drug use. The military versus civilian multiple suicide attempt group had a significantly higher frequency of non-PTSD anxiety disorder.

Overall, interpretation of the results from this aim should be considered with caution. While the methodology and measures for all RCTs were similar, there were some differences in assessment between the civilian and military sample, as well as differences in recruitment years. The civilian sample was collected in the early to mid 2000s where the military sample was collected in 2011 and 2012. National suicide rates have increased in recent years (CDC, 2012), making it difficult to account for the potential bias. Additionally, given the small military sample size, a single versus multiple/civilian versus military interaction could not be analyzed. Therefore, the differences between single versus multiple suicide attempt individuals in civilians and

military personnel cannot be determined. This study examined only the multiple attempt individuals to begin the process of understanding how these two groups may differ.

Military members with multiple suicide attempts were over three and a half times more likely to have a non-PTSD anxiety disorder than civilians and the civilians had much higher rates of problem drug use in independent analyses and were over three times more likely to have problem alcohol use (trend). One possible explanation for these findings is that military members may feel more comfortable disclosing some symptoms over others depending on their concern of career impact. For example, given the military's no tolerance drug policy, participants in the military sample may not have felt comfortable disclosing this information and in fact, of the entire military sample, only one participant endorsed drug use.

Another possible explanation related to the anxiety disorder diagnosis may be related to the specific disorders endorsed. When looking at specific diagnoses, Generalized Anxiety Disorder (GAD) and Agoraphobia without a History of Panic Disorder made up the high percentage of anxiety disorders in the military sample. In comparison, Rudd and colleagues (1996) also found that military members with multiple suicide attempts had higher rates of anxiety disorders; however, the highest frequencies were for Social Phobia and Specific Phobias. These different rates need to be considered cautiously because of the more extreme diagnostic exclusion criteria used in the study, likely making the overall sample less severe in psychopathology. Another explanation is that Rudd and colleagues investigated single versus multiple attempt individuals prior to OEF/OIF, making it likely that the participants in their study had different stressors from the participants in the current study. Of the military members with multiple suicide

attempts in this study, 58% had deployment experience and 46% experienced some form of combat on deployment. It could be that general levels of anxiety, common to a GAD diagnosis, and symptoms associated with Agoraphobia without a History of Panic Disorder, may actually be related to post-deployment reactions. Additionally, while PTSD did not distinguish the military members from the civilian participants, it is also possible that the military members were experiencing some PTSD symptoms, or subthreshold PTSD. Subthreshold PTSD has been correlated to increased suicidality (Jakupcak et al., 2011; Marshall, Olfson, Hellman, Blanco, & Struening, 2001).

Findings also indicate differences in problem substance use suggesting the civilians may have been more likely to indicate problem alcohol use and problem drug use. While it was predicted that the civilians would have problem drug use, specifically given military policies, it was not predicted for the civilians to also have more problem alcohol use. This finding could be due to the high rates in general of substance use in the civilian sample. Approximately 70% of civilian participants had problem alcohol use and 79% met criteria for a substance use disorder, compared to only approximately 30% in the military sample. While within a military group, multiple suicide attempt individuals may have higher rates of substance use; this rate may still be lower than what is seen in civilians with multiple suicide attempts. An alternate explanation, as previously stated, is that military service members continue to show reluctance to share information about the extent of their alcohol and drug use due to perceptions about the impact of such disclosure on one's military career.

The results did not support any between group differences for mood disorders, PTSD, or an indication of BPD traits. In regard to a mood disorder diagnosis, both

groups had over 90% of the participants with a mood disorder diagnosis. Similar to the null finding for mood disorders and single versus multiple, it seems that mood disorder diagnoses are not a strong between group predictor given the high rates. In regard to an indication of BPD traits, this null finding is not especially surprising given BPD traits has been found to be more prevalent in both military (Rudd et al., 1996) and civilian (Forman et al., 2004) multiple attempt status individuals. The BPD trait notation was predicted to be higher in civilians due to the screening process in the military; however, it could be that using an indication of BPD traits vice a full personality disorder diagnosis could explain the null finding. Traits associated with a personality disorder are not considered grounds for separation from the military, where an actual diagnosis prior to enrollment or during service is a disqualifying condition (Department of the Army, 2011).

The final null result associated with this aim was in regard to a diagnosis of PTSD. Civilians and military members with multiple suicide attempts had similar rates of PTSD, though eight of the 26 military participants were missing PTSD diagnosis data. The missing data were due to a different assessment in use for those participants. Specifically, the eight participants with missing data were only administered the Clinician Administered PTSD Scale (CAPS) to alleviate participant burden, given the length of the baseline assessment. Therefore, interpretation should be considered with caution as this analysis was underpowered. Overall, the rates of PTSD in multiple attempt status individuals in both groups (approximately 30%) were higher than commonly reported statistics for national samples (as high as 10%; Gradus, 2007), military cohort samples from 2001 to 2003 (approximately 2%; Smith et al., 2009) and within OEF/OIF veterans (18 to 20%; Hoge et al., 2004). Unfortunately, PTSD has not been a diagnosis separated

from anxiety disorders in general in the single versus multiple suicide attempt literature. Rudd and colleagues (1996) found a trend toward significance for PTSD in a pre-September 11th, 2001 sample with multiple suicide attempt individuals being more likely to have a PTSD diagnosis, but there has never been a comparison of military members to civilians. Despite the lack of difference between civilians and military, the high rates of PTSD warrant additional exploration, especially as PTSD has been reported to be associated with both suicidal ideation and suicide attempts, based on a systematic review of 52 studies (Krysinska & Lester, 2010).

Repeat Suicide Attempts during Study Participation

During the course of the two follow-ups, seven previously identified single suicide attempt status individuals made a second suicide attempt and 36 previously identified multiple attempt individuals made another suicide attempt. Given the small number of participants and risk of making a Type II error in regard to treatment effects, exploratory descriptions were conducted to shed light on how these participants may have differed from the other single and multiple suicide attempt individuals that did not make a repeat suicide attempt. Graphically represented data of the estimated marginal means of symptom-level variables for the repeat attempt groups and the no repeat attempt groups provided an indication for repeat attempt individuals (single and multiple) maintaining more severe and more stable symptomatology over time. These graphs also provided additional information pertaining to the findings from HLM analyses, as the largest differences between groups over time were in regard to suicidal ideation-*worst* and wish to die/wish to live-*worst*, with the repeat attempt groups showing the highest scores over time. While interpretation of these graphs needs to be approached with caution, they

could have strong clinical implications for suicide risk assessment with additional research.

Clinical Implications

There are four major clinical implications associated with the findings of this dissertation. First, clinically meaningful differences appear to exist between individuals with a multiple versus single suicide attempt. Specifically, multiple versus single suicide attempt individuals have a more severe psychiatric picture and a more severe symptom-level picture, especially as it relates to suicide-specific risk factors. Increased psychopathology and increased suicide-related symptoms may indicate a greater risk for eventual death by suicide, especially as multiple attempt individuals in this study showed more stability in their elevated symptom levels over time when they were feeling at their worst. One implication may be the need for different methods of conducting suicide risk assessment, which include the identification of multiple suicide attempts. Given the different psychiatric picture of single and multiple attempt individuals, it is strongly recommended that clinicians document a thorough risk assessment and include within that documentation, the number of previous suicide attempts. This documentation could prove to be instrumental for future clinicians to assess the individual's level of suicide risk.

Another clinical implication may be that the more substantial the symptomatology, as seen in multiple attempt individuals, the more intense the treatment must be. Also, the type of treatment appropriate for multiple attempt status individuals should be a consideration given the high prevalence of personality traits and the indication of more difficulty coping with fewer resources. Therefore, one long-term

recommendation is to formulate evidence-informed clinical assessment and practice guidelines that take into account the unique needs of individuals with single versus multiple suicide attempts.

The second important implication resulting from this study is the use of the wish to die/wish to live index for an assessment measure related to suicide-related behaviors. Brown and colleagues (2005) reported the effectiveness of the WDWL for predicting eventual suicide in a large outpatient sample and results of the current study lend additional support to its use for discriminating between high risk groups. Multiple suicide attempt individuals reported stronger wishes to die than the single attempt individuals at baseline. When WDWL was assessed based on when the participant was feeling his or her worst in their lifetime, the WDWL index differentiated between groups with the multiple attempt group maintaining higher scores. Additionally, support was found for the use of this measure through the exploratory description of the participants who reattempted suicide during the study. Though no analyses were run to confirm this, graphical representation of the data indicated the participants who reattempted suicide maintained stronger wishes to die over the follow-up compared to those who did not reattempt suicide. There is some support, therefore, for the use of this brief assessment measure to be used clinically to assess an individual's level of suicide risk; however, additional research in this area is first needed.

With additional research, the WDWL index could be used to provide valuable information about an individual's overall risk for suicide and also be a useful starting place for treating suicidality. A stronger wish to die can lead to an exploration of the specific reasons for living and reasons for dying a suicidal individual may have.

According to Jobes (2006), the specific reasons for living can be protective factors against suicide risk and therefore can be bolstered during treatment, while the reasons for dying can be useful in understanding the individual's distress and can then be the target of treatment.

The third important clinically-related issue is another issue related to assessment of suicide risk. It was hypothesized that individuals may make recurring suicide attempts because they maintain high levels of depression, hopelessness, suicidal ideation, and wish to die. Results from this study provide information indicating that assessing individuals' current level of symptoms may not be as important as assessing what their symptom levels were when they were feeling their worst. The individuals with multiple suicide attempts had higher reported levels of all symptoms tested at the baseline assessment, but the only measures that differed over time between these two groups were suicidal ideation-*worst* and wish to die/wish to live-*worst*. This finding was also supported with the exploratory description of the individuals who reattempted suicide during the study period. Although not tested statistically, these individuals maintained high levels of SSI-*worst* and WDWL-*worst* over the course of the study, despite having lower scores for the *current* SSI and WDWL. Beck, Brown, Steer, Dahlsgaard, and Girsham (1999) reported the SSI-*worst* to predict eventual death by suicide at an odds of almost 14 compared to only around 5.5 for the SSI-*current*. The work by Beck and colleagues lends support for the need to assess not only current levels of symptoms, but also symptoms at the worst point. Additional research is needed to test the usefulness of these measures in a clinical environment.

The final clinical implication to be discussed is related to military members with multiple suicide attempts. The results of this study indicate that military multiple suicide attempt status individuals may be similar to their civilian counterparts, in regard to their psychiatric picture. The two notable differences between these two groups were the high rates of anxiety disorder diagnoses in the military sample and substance issues in the civilian sample. With over three quarters of the military multiple attempt individuals meeting criteria for a non-PTSD anxiety disorder, additional attention may be warranted to understand this relationship. Potentially deployment stress or stressors unique to the military contribute to the high rates of anxiety disorders only in the military multiple attempt individuals; however, a substantial amount of research is needed to expand upon this speculation. Additionally, the higher rates of problem drug and problem alcohol (trend only) may be related to a fear of disclosure among the military members. Given the high risk of career impact, especially related to drug use, individuals may have been underreporting their substance use.

Limitations

Study design. This planned study is based on secondary analyses of data already collected from four different RCTs examining the efficacy of cognitive therapy for the prevention of suicide among those with a history of at least one suicide attempt. Similar to other studies relying on secondary analyses, we expect a number of limitations by using existing data. More specifically, a number of limitations are inherent in secondary data analyses because the studies from which this data is extracted were not originally designed to answer the questions currently of interest. Therefore, there is a lack of precise control on the part of the investigator analyzing data already collected in the

context of completed RCTs, in this instance. In a newly designed study examining differences between single and multiple suicide attempt status individuals, equal numbers of single and multiple attempt status individuals may be desired and subsequently planned for.

As another example, consider that the investigator is limited to the use of the originally selected measures and variables by primary RCT investigators as opposed to having the freedom to select a number of measures meant to answer focused research questions. In a newly designed study, the conduct of a thorough psychiatric assessment in order to determine a full range of psychopathology, including personality traits and disorders may be desirable. This study is limited by the measures that overlapped in all four RCTs. For example, it may have been interesting to examine sleep difficulties between single and multiple suicide attempt status individuals, but a sleep measure was not administered in all RCTs.

A second limitation to this proposed study as it relates to study design is due to the use of four different RCTs. Although the main purpose for all RCTs was similar and they each used similar methodology, there were differences in recruitment practices among the studies. First, two of the RCTs used a sample of military psychiatric inpatients and the other two used a sample of civilians (at times including Veterans but not active duty military personnel) recruited from an emergency department – who may or may not have been psychiatrically hospitalized following their suicide attempt. The years of recruitment also differed by RCT, making direct comparisons between the RCTs limited. This recruitment difference in addition to other methodology differences require careful consideration during statistical analyses, as well as caution in interpretation at the

conclusion of this study, given some inherent differences between these RCT samples.

Finally, please note that while this dissertation examines the questions pertaining to single versus multiple attempts in a prospective manner, direct questions about psychotherapy outcome are not posed and only survivors of suicide attempts are available for this project. Given that the findings of these RCTs have already been disseminated in the scientific literature (e.g., Brown et al., 2005) or are currently under preparation for future dissemination, this dissertation is not intended to assess primary and secondary outcomes for the single versus multiple suicide attempt groups. Instead, questions about characteristic psychiatric differences (e.g., ambivalence, hopelessness) among these two groups are posed. Therefore, the analyses to be performed will not directly determine if multiple suicide attempt status individuals are at a greater risk for dying by suicide, for instance. The study will be able to examine whether individuals with multiple versus single attempts differ psychiatrically, but will not be able to further examine these differences in relation to RCT outcomes.

External validity. The military sample in this study was small, consisting of only 39 participants versus 260 in the civilian sample. This small sample reduces the external validity of the findings pertaining to military versus civilian comparisons. Specifically, there was insufficient power to investigate an interaction between single and multiple attempt individuals, as well as civilian and military. Additionally, although the sample was mixed in regard to military branch with one quarter from the Navy, one fifth from the Marine Corps and just under one fifth from the Army, there was little representation from the Air Force. While it was hoped to account for Veteran status in

the UPenn sample, this information was only collected for a subset of the group, preventing any comparisons related to Veteran status.

Additionally, the overall sample was comprised mostly of African-American participants (50.2%), making it less likely to generalize to samples more representative of national demographics. Interestingly, several studies investigating single versus multiple attempts have been comprised of primarily African-American samples (Forman et al., 2004; Kaslow et al., 2006; Reynolds & Eaton, 1986), despite the historically lower rates of suicide and suicide attempt among African-American individuals as compared to Caucasian individuals in the U.S. (Goldsmith et al., 2002). More recent concerns have emerged about suicide behaviors in the African-American population, especially as it relates to comparable suicide attempt rates between African-American and Caucasian high school students (Centers for Disease Control and Prevention, 2006) and Caribbean black men (Joe, Baser, Breeden, Neighbors, & Jackson, 2006). To our knowledge, there has not been a study to investigate possible differences between African-American multiple attempt individuals and other ethnic groups; therefore, it is difficult to know if this sample will generalize to all single and multiple attempt individuals.

Power. Given the use of RCTs originally designed for treatment outcome studies, it was determined that the best approach to ensure treatment effects did not sway the findings of the longitudinal aim (i.e., symptomatology over time) was to only analyze participants assigned to the control condition. While this decision eliminated the possibility for treatment effects, it reduced the sample size making the aim underpowered to detect a small effect size. Additionally, due to the small sample size of the military participants, this study was unable to examine potential interactions between single and

multiple attempt individuals, as well as civilians and military members. As a proxy for understanding the differences between civilians and military personnel, the multiple attempt individuals were compared based on civilian or military status. The civilian to military comparison would have required a close to moderate effect size to detect differences and with only 19 participants with known diagnostic information about PTSD, there was insufficient power to detect differences on this variable.

Strengths

Study design. The use of data, collected from four RCTs at two separate sites, is a notable strength of this study. To date, there are only a limited number of psychotherapy outcome studies for the prevention of suicide and the author of this dissertation has been able to gain permission to use data from four well-designed and peer-reviewed funded RCTs. In addition to the robust methodology incorporated in the use of RCTs, this design allows for increased external validity. Although the military sample was small in size, by having a mix of military and civilian participants, the findings as a whole are likely to generalize more to the population of single and multiple suicide attempt individuals.

Additionally, a prospective design allows for a more detailed account of participant symptom levels over time (Sarafino, 2005); thereby reducing the bias associated with only a snapshot of symptoms at one time point as seen in the cross-sectional studies examining single versus multiple suicide attempts. Bias was also reduced in this study by the use of hierarchical linear modeling (HLM) to analyze the longitudinal data. HLM adds to the robust nature of this methodology due to the overall reduction of error in longitudinal analyses (Ferron et al., 2004). Specifically, HLM is

considered superior to other statistical tests, such as a repeated measures analysis of variance, because of its ability to take into consideration that multiple data points from a single person are not completely independent. Additionally, HLM provides more options for working with missing follow-up data than a more traditional method of analysis, such as a repeated measures analysis of variance (Ferron et al., 2004).

Significance. Despite the limitations of this study, this study effectively advances our understanding of single versus multiple suicide attempt individuals as it pertains to symptoms and psychopathology shortly after a suicide attempt, as well as differences in symptom stability over time. As previously mentioned, to our knowledge, this was the first study to directly examine single and multiple suicide attempt status individuals over time. By looking at this population longitudinally, we can not only learn how these individuals change over time, but we can also get an indication of their psychiatric profile over time. Additionally, this study effectively fills in some of the gaps in the literature pertaining to civilian and military individuals with multiple suicide attempts. In addition to being the first longitudinal study, this study is only the third study to look at single and multiple suicide attempt status individuals in a military sample and the first to directly compare military members to civilian members.

Overall, this research has clinical implications that are important to future suicide prevention practice. The idea that one size fits all for risk assessment and treatment are simply not sufficient and the implications of this study show that we need to rethink our suicide prevention strategies to meet the unique needs of subgroups or types.

Future Directions

Research recommendations. This study was the first study to our knowledge to specifically target single versus multiple attempt status individuals to increase our knowledge of how these two groups differ in symptomatology over time. While findings indicate multiple attempt individuals maintain more stable higher level symptomatology, this finding needs to be replicated with an adequately powered study. One way to accomplish this would be to have all RCTs specifically addressing suicide prevention include a single versus multiple attempt component and provide this data in publication. It would also be useful to extend this work by using a longer follow-up period, as well as more data collection time points to allow for detailed growth curve profiles of symptom levels over time for the purpose of improving our understanding of suicide attempt recurrence. Specifically, it is recommended that a study using ecological momentary assessment be considered for this line of research, as it allows for close to real time data, as well as many data points, allowing for detailed profiles of symptom levels to be captured. This work could provide invaluable information on what the person is experiencing leading up to the decision to make another suicide attempt.

As previously indicated, suicidal ideation assessed for the *worst* time point and wish to die/wish to live index assessed for the *worst* point were found to be the primary measures distinguishing single and multiple attempt status individuals. Additional studies to validate these measures in a number of populations would extend the credibility of these findings, as well as be useful for suicide risk assessment. Research on the SSI-*worst* and WDWL-*worst* extended to a clinical application would be extremely useful. With additional testing, these measures could be used in a clinical setting on a

weekly basis to monitor a suicidal individual's risk level, allowing for intervention before suicide attempt recurrence.

With strong support overall in the literature for multiple attempt status individuals having more severe psychopathology and more chronic difficulties, it needs to be considered that these individuals may require different treatment approaches than those with a single suicide attempt. As RCTs continue to evaluate the effectiveness of treatment for suicidality, it would be useful to determine if the treatment effects were the same for both single attempt individuals and multiple attempt individuals. This line of research would be a good starting place for the understanding and possible future development of treatment geared specifically to those individuals with multiple suicide attempts.

Lastly, this was only the third study to look specifically at military members with multiple suicide attempts and the first to compare them directly to a civilian sample. Results indicate that military members with multiple attempts are experiencing higher rates of anxiety disorders compared to civilians. This finding needs to be both replicated and expanded on to increase our understanding. It would be particularly important to determine if there are deployment factors or other unique military stressors influencing the higher rates of anxiety disorders or possibly self-report issues pertaining to concerns about one's military career that impact what is observed within this high risk group. Additionally, this study was unable to examine the potential role of attachment and unit cohesion in the recurrence of suicide attempts. As previously cited earlier in this paper, some military members experience great distress by being separated from their unit (Department of Defense, Task Force on the Prevention of Suicide by Members of the

Armed Forces, 2010). This separation may specifically increase an individual's risk for suicidal behavior as the interpersonal psychological theory of suicide poses that thwarted belongingness plays a crucial role in suicidality (Joiner, 2005). Additional research investigating the unique stressors related to attachment and belonging within a military setting is necessary to further understand how single and multiple attempt individuals may differ in military personnel.

Policy recommendations. One important recommendation for the DoD is to continue to improve the surveillance efforts on suicide attempts, particularly collecting data on single versus multiple attempt status both in the context of suicide death investigations and in the context of behavioral health and primary care. Having accurate knowledge of an individual's suicide attempt history will be critical to conceptualization and delivery of effective treatment. Another important recommendation is to ensure clinical providers, both in primary care and behavioral health, have adequate training on assessing and treating suicidality, but also adequate understanding of the increased risk and unique clinical picture that surrounds individuals with multiple suicide attempts. The Center for Deployment Psychology is taking a step in the right direction on this issue by providing an online course for providers on assessment and treatment of suicidality in a military population (Center for Deployment Psychology, 2013). Within the training, there is a section covering differences between single suicide attempt individuals and multiple attempt individuals and the more chronic nature of the difficulties facing the multiple attempt individuals (Center for Deployment Psychology, 2013). It is recommended that this type of training become more widespread and that multiple

attempt individuals are identified in clinical practice guidelines as a unique group of suicidal individuals.

Summary. While there are some limitations inherent in conducting secondary analyses, the robust nature of using data from RCTs and the uniqueness of this study make it a notable contribution both to the scientific literature and to national as well as DoD suicide prevention efforts. With the extremely high rates of suicide and suicide attempts within this country and the U.S. military, tertiary prevention is essential. The findings from this study have further advanced our understanding of the differences between the individuals who may attempt suicide only once versus those who repeatedly attempt. Additionally, the findings have important clinical implications and they have provided a path for future research so we can better prepare and adapt suicide risk assessment, management, and treatment efforts.

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SINGLE VERSUS MULTIPLE SUICIDE ATTEMPTS

Tables

Table 1

Listing of Selected Measures Administered at Baseline and Follow-up Time Points

Measure	RCTs	Method	Time 1: Baseline	Time 2: 1-month follow-up	Time 3: 3-month follow-up
Alcohol and Drug Screen	UPenn	Clinician	X		
Alcohol Use Disorders Identification Test	USUHS	Self-report	X		
Beck Depression Inventory-II	All	Self-report	X	X	X
Beck Hopelessness Scale	All	Self-report	X	X	X
BPD Traits Screen	UPenn	Clinician	X		
Demographics Form	All	Self-report	X		
Informed Consent	All	Self-report	X		
Mini International Neuropsychiatric Screen & Interview	USUHS	Clinician	X		
Personality Beliefs Questionnaire Short Form	USUHS	Self-report	X		
Scale for Suicide Ideation	All	Clinician	X	X	X
Structured Clinical Interview for DSM Disorders	UPenn	Clinician	X		

Note. Selected measures are measures specifically selected for the purpose of answering the research questions posed by this dissertation study.

Table 2

Listing of Selected Information and Associated Variables for all RCTs

Information	Source(s)	UPenn RCTs Selected Variables	USUHS RCTs Selected Variables
Demographics	Demographic Form	Age, Sex, Race/Ethnicity, Marital Status, Education	Age, Sex, Race/Ethnicity, Marital Status, Education, Military Rank
Ambivalence about Living and Dying	SSI	Wish to die/wish to live index score created by SSI Item 1 reverse coded and subtracted from SSI Item 2	Wish to die/wish to live index score created by SSI Item 1 reverse coded and subtracted from SSI Item 2
Depressive Symptoms	BDI-II	Total Score for Items 1-21	Total Score for Items 1-21
Hopelessness	BHS	Total Score for Items 1-20	Total Score for Items 1-20
Suicide Ideation	SSI	Total Score for Items 1-19	Total Score for Items 1-19
Problem Alcohol or Drug Use	AUDIT-SF Alcohol and Drug Screen MINI	Alcohol and Drug Screen Item Scores for Items 6-13	AUDIT-SF Total Score for Items 1-10 MINI Items K2-K3
Axis I Diagnoses	MINI SCID-I	SCID-I Summary Sheet	MINI Summary Sheet
Indication of Borderline Personality Traits	BPD Screen PBQ-SF	BPD Screen Total Score for Items 1-15	PBQ-SF Total Score for BPD Items

Note. Selected measures are measures specifically selected for the purpose of answering the research questions posed by this dissertation study. SSI = Scale for Suicide Ideation; BDI-II = Beck Depression Inventory-Second Edition; BHS = Beck Hopelessness Scale; AUDIT = Alcohol Use Disorders Identification Test: Self-Report Version; MINI = Mini International Neuropsychiatric Screen & Interview; SCID-I = Structured Clinical Interview for Axis I of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; PBQ-SF = Personality Belief Questionnaire Short Form.

Table 3

Listing of Originally Formatted Variables for all RCTs and Recoded Variables

Variable	USUHS RCTs	UPenn RCTs	Recoded Variable
Age	Locator and Demographic Form Item 2 Age- Write-in	Age – Numeric	Age – Numeric
Sex	Locator and Demographic Form Item 3 Sex coded as 0 or 1	Personal Data Form Sex coded as 0 or 1, male or female	Male; Female
Race /Ethnicity	Locator and Demographic Form Item 4 Race/Ethnicity coded as 1 to 7; American Indian or Alaskan Native; Asian; Black or African American; Hispanic or Latino; Native Hawaiian or Other Pacific Islander; White; Other	Personal Data Form Race/Ethnicity coded as 1 to 6,-13; American Indian; Asian; African-American; Hispanic; White; Other or Native Hawaiian/Pacific Islander; N/A or Other	Caucasian; African-American; Hispanic/Asian/Other
Marital Status	Locator and Demographic Form Item 10 Marital Status coded as 1 to 8; Never Married; 1 st Marriage; 2 nd Marriage; 3+ Marriage; Separated; Cohabiting/Unmarried; Divorced; Widowed	Personal Data Form Marital Status coded as 1 to 6; Married; Widowed or Separated; Separated or Widowed; Divorced; Never Married; N/A or Committed Partnership	Married; Never Married; Divorced/Separated/Widowed
Education	Locator and Demographic Form Item 8 Education coded as 1 to 7; Less than 9 th grade; 9 th -12 th grade no diploma; High school diploma or equivalent; Some college, no degree; Associate Degree; Bachelor's Degree; Graduate or Professional Degree	Personal Data Form Education Level coded as 1 to 6; 6 th grade; 7 th to 11 th grade; High School; Some college; College degree; Graduate school	Less than high school; High School; Some college; College graduate; Graduate School

Variable	USUHS RCTs	UPenn RCTs	Recoded Variable
Wish to die/wish to live	SSI Item 1 Wish to live coded as 0 “Moderate to Strong”, 1 “Weak”, or 2 “None”. SSI Item 2 Wish to die coded as 0 “None”, 1 “Weak”, 2 “Moderate to Strong”	SSI Item 1 Wish to live coded as 0 “Moderate to Strong”, 1 “Weak”, or 2 “None”. SSI Item 2 Wish to die coded as 0 “None”, 1 “Weak”, 2 “Moderate to Strong”	Wish to die/wish to live difference score. Wish to live coded as 0 “None”, 1 “Weak”, 2 “Moderate to Strong” subtracted from Wish to die coded as 0 “None”, 1 “Weak”, 2 “Moderate to Strong”
BDI-II Total Score	BDI-II Total Score	BDI-II Total Score	BDI-II Total Score – Numeric
BHS Total Score	BHS Total Score	BHS Total Score	BHS Total Score – Numeric
SSI Total Score	SSI Total Score	SSI Total Score	SSI Total Score – Numeric
Problem Alcohol or Drug Use	AUDIT Total Score	Alcohol and Drug Screen	Present; Absent
Axis I Diagnoses	MINI each disorder coded as 0 to 1 for presence or absence	SCID-I	Mood DO Present; Mood DO Absent; Anxiety DO (non-PTSD) Present; Anxiety DO (non-PTSD) Absent; PTSD Present; PTSD Absent; Substance DO Present; Substance DO Absent; Other DO Present; Other DO Absent
Indication of BPD Traits	PBQ-SF	BPD Screen	Present; Absent

Note. SSI = Scale for Suicide Ideation; BDI-II = Beck Depression Inventory-Second Edition; BHS = Beck Hopelessness Scale; AUDIT = Alcohol Use Disorders Identification Test: Self-Report Version; MINI = Mini International Neuropsychiatric Screen & Interview; SCID-I = Structured Clinical Interview for Axis I of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; PBQ-SF = Personality Belief Questionnaire Short Form.

Table 4

Demographic Characteristics (N = 299)

Characteristics	<i>n</i>	%	<i>M</i>	<i>SD</i>
Demographic				
Age	296		35.20	10.28
Sex				
Male	140	46.8		
Female	155	51.8		
Unknown	4	1.4		
Ethnicity				
Caucasian	115	38.5		
African-American	150	50.2		
Hispanic	13	4.3		
Asian	4	1.3		
Other	12	4.0		
Unknown	5	1.7		
Marital Status				
Married	68	22.8		
Divorced/Separated/Widowed	75	25.1		
Never Married	143	47.8		
Unknown	13	4.3		
Education				
Less than High School	89	29.8		
High School	92	30.8		
Some College	68	22.7		
College Graduate	28	9.4		
Graduate School	10	3.3		
Unknown	12	4.0		

Table 5

Baseline Psychiatric Characteristics (N = 299)

Psychiatric Symptomatology	<i>M</i>	<i>SD</i>
Beck Depression Inventory-II	31.18	13.15
Beck Hopelessness Scale	11.55	6.23
Scale for Suicide Ideation- <i>current</i>	12.34	11.67
Scale for Suicide Ideation- <i>worst</i>	27.27	6.54
Wish to Die/Wish to Live Index- <i>current</i>	-0.19	1.50
Wish to Die/Wish to Live Index- <i>worst</i>	1.53	0.86
Psychiatric Diagnosis	<i>n</i>	%
Axis I		
Mood Disorder	266	89.0
Anxiety Disorder		
Non-Posttraumatic Stress Disorder	106	35.5
Posttraumatic Stress Disorder	70	23.4
Substance Disorder	202	67.6
Problem Alcohol Use	178	59.5
Problem Drug Use	198	66.2
Other Axis I Disorder	47	15.7
Axis II		
Indication of Borderline Personality Disorder Traits	97	32.4

Table 6

Summary of Logistic Regression Analysis Predicting Suicide Attempt Status based on Baseline Psychiatric Characteristics

Variable	<i>B</i>	<i>SE</i>	<i>OR</i>	95% CI	Wald statistic	<i>p</i>
Step 1						
Anxiety Disorder	0.63	0.32	1.87	[1.00, 3.51]	3.86	.050
Mood Disorder	0.67	0.43	1.95	[0.83, 4.56]	2.38	.123
Other Axis I DO	0.22	0.41	1.24	[0.57, 2.72]	0.30	.587
Posttraumatic Stress Disorder	0.67	0.36	1.95	[0.97, 3.95]	3.46	.063
Problem Alcohol	0.39	0.34	1.47	[0.76, 2.84]	1.34	.248
Problem Drug	0.78	0.40	2.19	[1.00, 4.79]	3.81	.051
Substance Disorder	0.21	0.41	1.24	[0.55, 2.77]	0.27	.606
Step 2						
Anxiety Disorder	0.50	0.33	1.65	[0.87, 3.13]	2.34	.126
Borderline Personality DO Traits	1.16	0.36	3.17	[1.58, 6.38]	10.49	.001
Mood Disorder	0.68	0.45	1.96	[0.82, 4.73]	2.26	.133
Other Axis I DO	0.20	0.41	1.22	[0.54, 2.72]	0.23	.632
Posttraumatic Stress Disorder	0.57	0.37	1.77	[0.85, 3.66]	2.36	.125
Problem Alcohol	0.26	0.34	1.30	[0.67, 2.53]	0.60	.440
Problem Drug	0.79	0.40	2.21	[1.00, 4.87]	3.87	.049
Substance Disorder	0.18	0.42	1.20	[0.53, 2.71]	0.19	.666

Note. Step 1 of the model, $\chi^2(7) = 23.63$, $p = .001$; Step 2 of the model, $\chi^2(1) = 11.91$, $p = .001$; Overall model $\chi^2(8) = 35.54$, $p < .001$

Table 7

Frequency of Number of Baseline Axis I Disorders in Individuals with a Single Suicide Attempt (n = 84) and Multiple Suicide Attempt (n = 215)

Number of Axis I Disorders	Single Suicide Attempt (n = 84)		Multiple Suicide Attempt (n = 215)	
	<i>n</i>	%	<i>n</i>	%
0	1 _a	1.2	0 _a	0.0
1	15 _a	17.9	16 _a	7.4
2	23 _a	27.4	41 _a	19.1
3	23 _a	27.4	55 _a	25.6
4	22 _b	26.2	103 _b	47.9

Note. Overall Chi-square model, $\chi^2(4) = 17.72$, $p = .001$. Subscripts indicate column proportions that do not differ significantly from each other at the $p < .05$ level.

SINGLE VERSUS MULTIPLE SUICIDE ATTEMPTS

Table 8

Summary of Fixed Effects of Individual Growth Trajectories of Depression with Suicide Attempt Status as a Predictor

Parameter	β	SE	df	t	95% CI	p
Intercept	24.54	1.88	170.85	13.08	[20.84, 28.25]	<.001
Time	-10.03	1.94	214.21	-5.17	[-13.86, -6.20]	<.001
Quadratic Time	2.88	0.79	121.26	3.63	[1.31, 4.46]	<.001
Suicide Attempt Status	9.17	2.20	174.83	4.17	[4.83, 13.51]	<.001
Time * Suicide Attempt Status	-2.28	1.40	137.20	-1.63	[-5.05, 0.49]	.106

Note. Reference group for Time is baseline and reference group for Suicide Attempt Status is single suicide attempt.

SINGLE VERSUS MULTIPLE SUICIDE ATTEMPTS

Table 9

Summary of Fixed Effects of Individual Growth Trajectories of Hopelessness with Suicide Attempt Status as a Predictor

Parameter	β	SE	df	t	95% CI	p
Intercept	10.49	0.91	167.31	11.56	[8.70, 12.28]	<.001
Time	-3.56	1.02	204.24	-3.48	[-5.57, -1.54]	.001
Quadratic Time	1.26	0.43	121.99	2.94	[0.41, 2.11]	.004
Suicide Attempt Status	1.57	1.07	168.69	1.47	[-0.54, 3.67]	.143
Time * Suicide Attempt Status	-0.42	0.71	138.90	-0.59	[-1.82, 0.99]	.558

Note. Reference group for Time is baseline and reference group for Suicide Attempt Status is single suicide attempt.

Table 10

Summary of Fixed Effects of Individual Growth Trajectories of Current Suicidal Ideation with Suicide Attempt Status as a Predictor

Parameter	β	SE	df	t	95% CI	p
Intercept	10.87	1.58	164.68	6.90	[7.76, 13.98]	<.001
Time	-11.13	1.72	189.75	-6.48	[-14.51, -7.74]	<.001
Quadratic Time	3.85	0.74	112.65	5.20	[2.38, 5.32]	<.001
Suicide Attempt Status	2.30	1.84	152.80	1.25	[-1.34, 5.93]	.214
Time * Suicide Attempt Status	-1.61	1.11	142.14	-1.45	[-3.82, 0.59]	.151

Note. Reference group for Time is baseline and reference group for Suicide Attempt Status is single suicide attempt.

Table 11

Summary of Fixed Effects of Individual Growth Trajectories of Worst Suicidal Ideation with Suicide Attempt Status as a Predictor

Parameter	β	SE	df	t	95% CI	p
Intercept	27.46	1.03	148.60	26.77	[25.43, 29.48]	<.001
Time	-27.77	2.03	165.52	-13.71	[-31.77, -23.77]	<.001
Quadratic Time	8.92	0.91	165.52	-13.71	[7.12, 10.72]	<.001
Suicide Attempt Status	-0.22	1.22	148.99	-0.18	[-2.63, 2.19]	.857
Time * Suicide Attempt Status	3.47	1.30	136.00	2.66	[0.89, 6.05]	.009

Note. Reference group for Time is baseline and reference group for Suicide Attempt Status is single suicide attempt.

Table 12

Frequency of Demographic Variables in Civilian (n = 188) and Military (n = 26) Individuals with Multiple Suicide Attempts

Variables	Civilian (n = 188)		Military (n = 26)		χ^2	df	p
	n	%	n	%			
Sex					1.26	1	.261
Male	85	45.9	15	57.7			
Female	100	54.1	11	42.3			
Race/Ethnicity					12.48	2	.002
African-American	107	57.5	5	20.0			
Caucasian	64	34.4	16	64.0			
Other	15	8.1	4	16.0			
Marital Status					6.63	2	.036
Married	36	19.9	10	43.5			
Divorced/Separated	53	29.3	4	17.4			
Never Married	92	50.8	9	39.1			
Education					30.17	4	< .001
Less than High School	68	37.0	0	0			
High School Graduate	62	33.7	5	21.7			
Some College	37	20.1	9	39.1			
College Graduate	13	7.1	7	30.4			
Graduate School	4	2.2	2	8.7			

Table 13

Frequency of Psychiatric Variables in Civilian (n = 188) and Military (n = 26) Individuals with Multiple Suicide Attempts

Variables	Civilian (<i>n</i> = 188)		Military (<i>n</i> = 26)		$\chi^2(1)$	<i>p</i>
	<i>n</i>	%	<i>n</i>	%		
Axis I						
Mood Disorder	170	90.4	24	92.3	0.10	.757
Anxiety Disorder						
Non-PTSD	60	31.9	20	76.9	19.77	<.001
PTSD	51	27.1	5	27.8	0.00	.953
Substance Disorder	149	79.3	8	30.8	27.48	< .001
Problem Alcohol	131	69.7	8	34.8	11.10	.001
Problem Drug	155	82.4	0	0	77.75	< .001
Other Axis I Disorder	30	16.0	4	15.4	0.01	.940
Axis II						
Indication of BPD Traits	75	39.9	8	53.3	1.04	.308

Table 14

Summary of Logistic Regression Analysis Predicting Military Status based on Psychiatric Characteristics with Demographic Covariates

Variable	<i>B</i>	<i>SE</i>	<i>OR</i>	95% CI	Wald statistic	<i>p</i>
Age	-0.08	0.36	0.93	[0.86, 0.99]	4.69	.030
Caucasian	1.45	0.61	4.27	[1.29, 14.14]	5.63	.018
Never Married	-1.53	0.62	0.22	[0.07, 0.72]	6.16	.013
High School or Less	-1.38	0.61	0.25	[0.08, 0.83]	5.13	.024
Problem Alcohol	-1.18	0.65	0.31	[0.09, 1.10]	3.31	.069
Non-PTSD Anxiety Disorder	1.28	0.60	3.59	[1.12, 11.53]	4.61	.032
Substance Disorder	-0.89	0.64	0.41	[0.12, 1.44]	1.93	.165

Note. Overall Model $\chi^2(7) = 55.07, p < .001$

Table 15

Anxiety Disorder Frequencies in Military (n = 26) and Civilian (n = 188) Individuals with Multiple Suicide Attempts

Diagnosis	Civilian Status (n = 188)		Military Status (n = 26)	
	n	%	n	%
Agoraphobia without a history of Panic Disorder	0	0	8	30.8
Anxiety Disorder NOS	3	1.6	0	0
Generalized Anxiety Disorder	7	3.7	17	65.4
Obsessive Compulsive Disorder	5	2.7	3	11.5
Panic Disorder	31	16.5	3	11.5
Social Phobia	16	8.5	5	19.2
Specific Phobia	9	4.8	0	0

Table 16

Frequency of Number of Axis I Disorders in Civilian (n = 188) and Military (n = 26) Individuals with Multiple Suicide Attempts

Number of Axis I Disorders	Civilian (n = 188)		Military (n = 26)	
	n	%	n	%
1	14	17.4	2	7.7
2	31	16.5	9	34.6
3	48	25.5	7	26.9
4	95	50.5	8	30.8

Note. Overall Chi-square model, $\chi^2(3) = 5.89, p = .117$

Table 17

Summary of Fixed Effects of Individual Growth Trajectories of Current Wish to Die/Wish to Live Index with Suicide Attempt Status as a Predictor

Parameter	β	<i>SE</i>	<i>df</i>	<i>t</i>	95% CI	<i>p</i>
Intercept	-0.35	0.21	160.96	-1.64	[-0.77, 0.07]	.103
Time	-1.23	0.26	182.77	-4.79	[-1.74, -0.72]	<.001
Quadratic Time	0.42	0.11	120.63	3.64	[0.19, 0.64]	<.001
Suicide Attempt Status	0.25	0.25	157.53	0.98	[-0.25, 0.74]	.331
Time * Suicide Attempt Status	-0.16	0.15	138.12	-1.04	[-0.46, 0.14]	.300

Note. Reference group for Time is baseline and reference group for Suicide Attempt Status is single suicide attempt.

Table 18

Summary of Fixed Effects of Individual Growth Trajectories of Most Severe Wish to Die/Wish to Live Index Scores with Suicide Attempt Status as a Predictor

Parameter	β	<i>SE</i>	<i>df</i>	<i>t</i>	95% CI	<i>p</i>
Intercept	1.46	0.13	148.31	10.93	[1.19, 1.72]	<.001
Time	-2.89	0.29	154.00	-10.00	[-3.46, -2.32]	<.001
Quadratic Time	0.92	0.13	111.35	7.28	[0.67, 1.17]	<.001
Suicide Attempt Status	0.05	0.16	147.37	0.34	[-0.26, 0.37]	.735
Time * Suicide Attempt Status	0.36	0.17	131.67	2.11	[0.02, 0.70]	.036

Note. Reference group for Time is baseline and reference group for Suicide Attempt Status is single suicide attempt.

Table 19

Psychiatric Characteristics for Single Suicide Attempt (n = 77), Single Repeat Suicide Attempt (n = 7), Multiple Suicide Attempt (n = 180), and Multiple Repeat Suicide Attempt (n = 36) Individuals

Symptom	Baseline			1-Month			3-Month		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
BDI-II									
Single Attempt	52	22.79	12.86	52	16.96	11.51	52	14.81	12.72
Repeat Single	7	30.86	13.26	7	27.86	11.34	7	20.71	17.45
Multiple Attempt	115	32.87	12.42	115	21.94	13.71	115	20.49	13.43
Repeat Multiple	29	34.48	13.17	29	26.62	13.24	29	26.17	12.17
BHS									
Single Attempt	51	9.16	6.16	51	7.61	5.80	51	7.43	6.03
Repeat Single	7	9.86	6.26	7	6.00	4.62	7	8.86	8.05
Multiple Attempt	114	11.88	6.26	114	9.28	5.93	114	8.12	5.59
Repeat Multiple	28	13.46	5.76	28	11.25	6.51	28	10.75	6.23
SSI-current									
Single Attempt	48	10.10	12.80	48	2.27	5.94	48	2.94	6.25
Repeat Single	6	11.33	8.76	6	5.83	7.65	6	4.00	8.00
Multiple Attempt	114	12.05	10.34	114	3.86	6.32	114	2.64	5.45
Repeat Multiple	29	11.69	10.85	29	5.62	8.93	29	4.97	8.71
SSI-worst									
Single Attempt	47	24.94	7.33	47	7.28	10.47	47	7.68	9.57
Repeat Single	6	27.00	5.33	6	20.17	8.16	6	16.17	11.07
Multiple Attempt	110	27.83	6.02	110	10.23	9.58	110	9.81	9.81
Repeat Multiple	28	27.71	9.25	28	17.07	11.01	28	22.36	11.54
WDWL-current									
Single Attempt	52	-0.58	1.58	52	-1.52	0.90	52	-1.40	1.00
Repeat Single	7	-0.43	1.13	7	-0.71	1.38	7	-1.00	1.73
Multiple Attempt	112	-0.14	1.36	112	-1.21	1.13	112	-1.18	1.08

Repeat Multiple	26	-0.42	1.21	26	-0.77	1.39	26	-1.12	1.31
WDWL-worst									
Single Attempt	49	1.16	1.14	49	-0.80	1.37	49	-0.71	1.29
Repeat Single	7	1.29	0.76	7	0.86	1.07	7	0.86	0.90
Multiple Attempt	107	1.62	0.68	107	-0.08	1.47	107	-0.32	1.38
Repeat Multiple	25	1.60	0.96	25	0.68	1.28	25	0.92	1.32

SINGLE VERSUS MULTIPLE SUICIDE ATTEMPTS

Figures

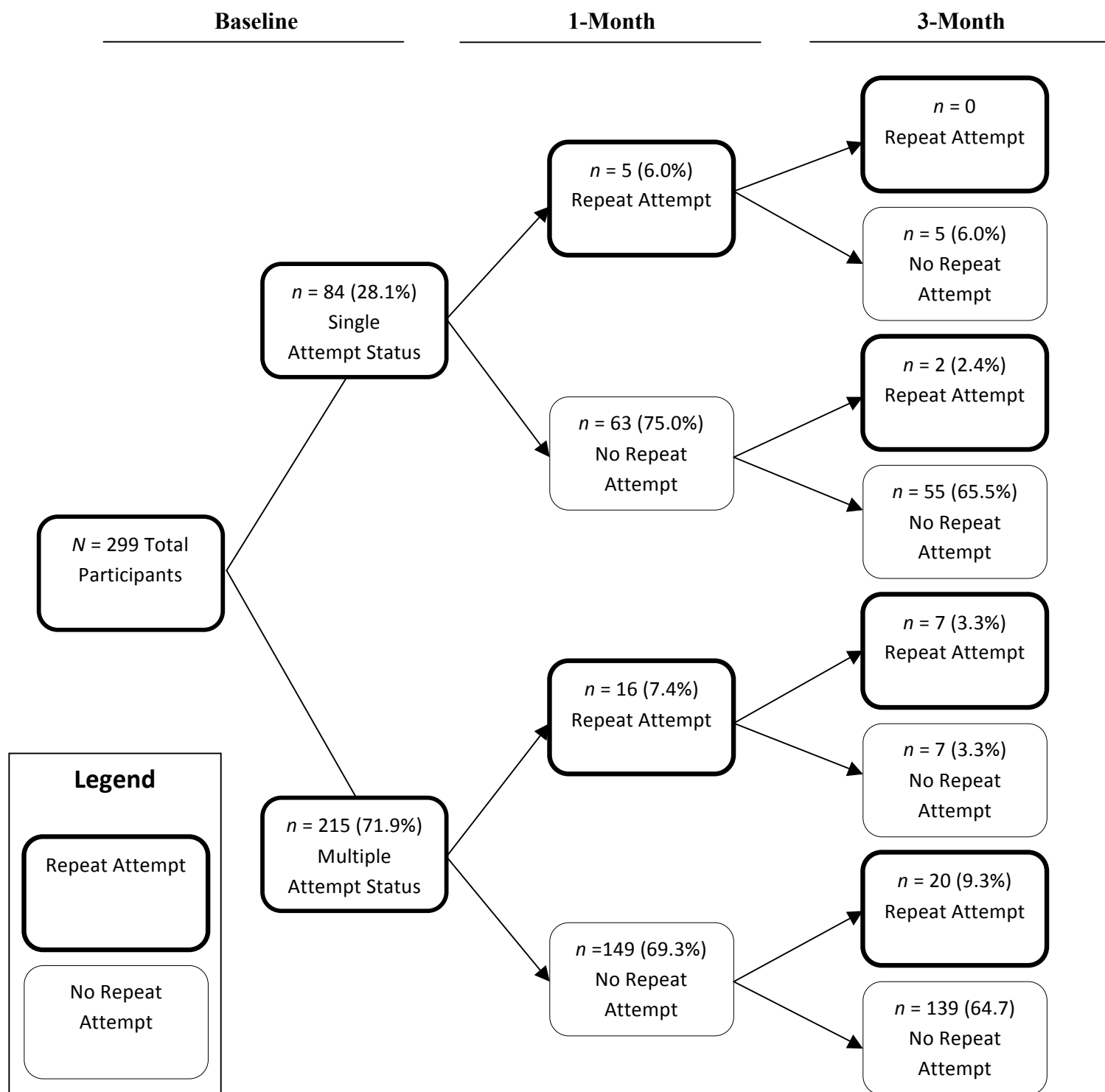


Figure 1. Suicide attempt characteristics of $N = 299$ participants at baseline, 1-month, and 3-month follow-ups. Percentages represent percent within each group at each time point based on original group size. Percentages do not add up to 100% due to missing data.

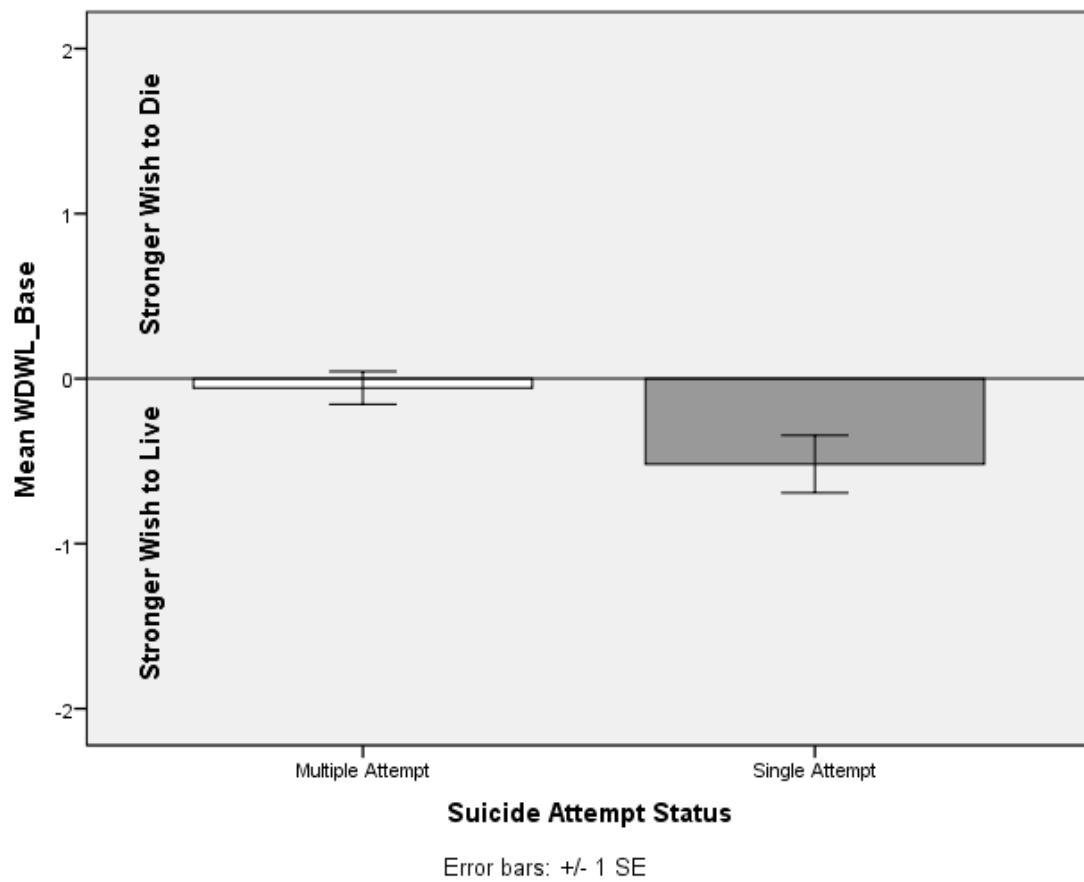


Figure 2. Mean Wish to Die/Wish to Live Index Score-Current in Single Suicide Attempt ($n = 82$) and Multiple Suicide Attempt ($n = 213$) Status Individuals. Independent samples t-test, $t(138.5) = 2.30$, $p = .023$.

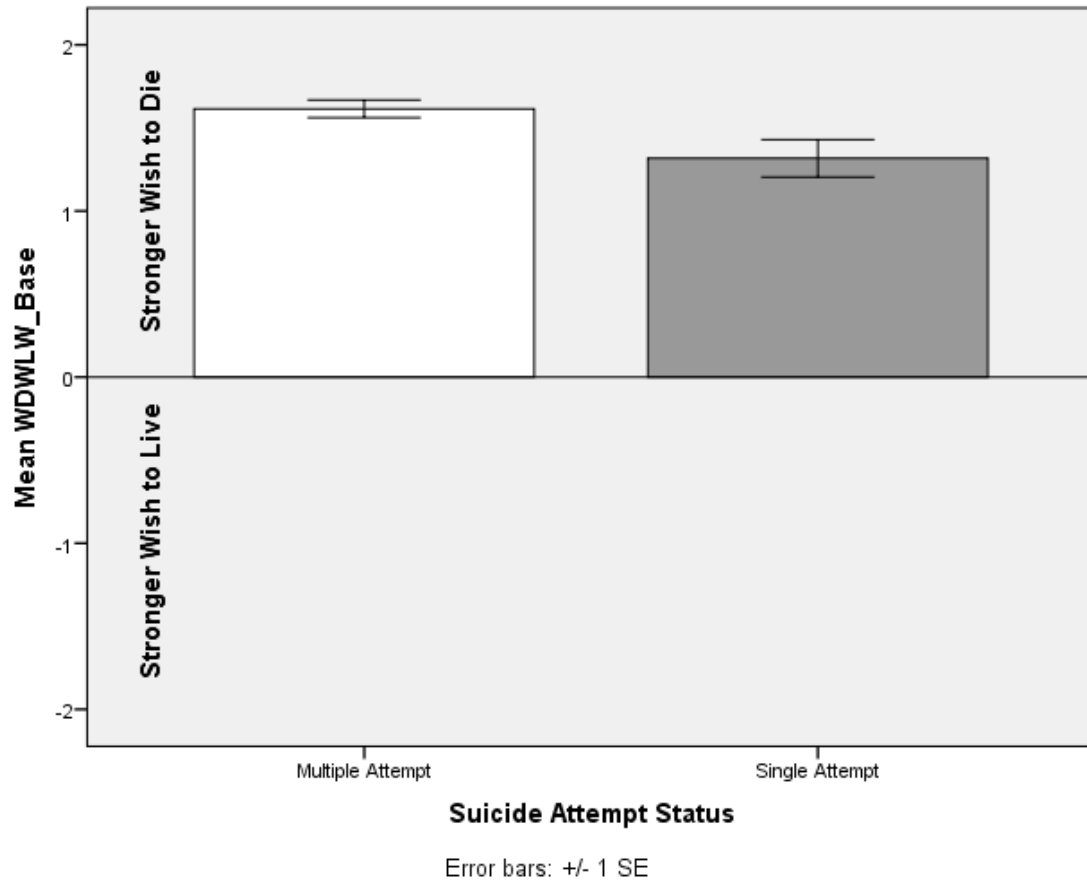


Figure 3. Mean Wish to Die/Wish to Live Index Score-Worst in Single Suicide Attempt ($n = 82$) and Multiple Suicide Attempt ($n = 213$) Status Individuals. Independent samples t-test, $t(118.7) = -2.40$, $p = .018$.

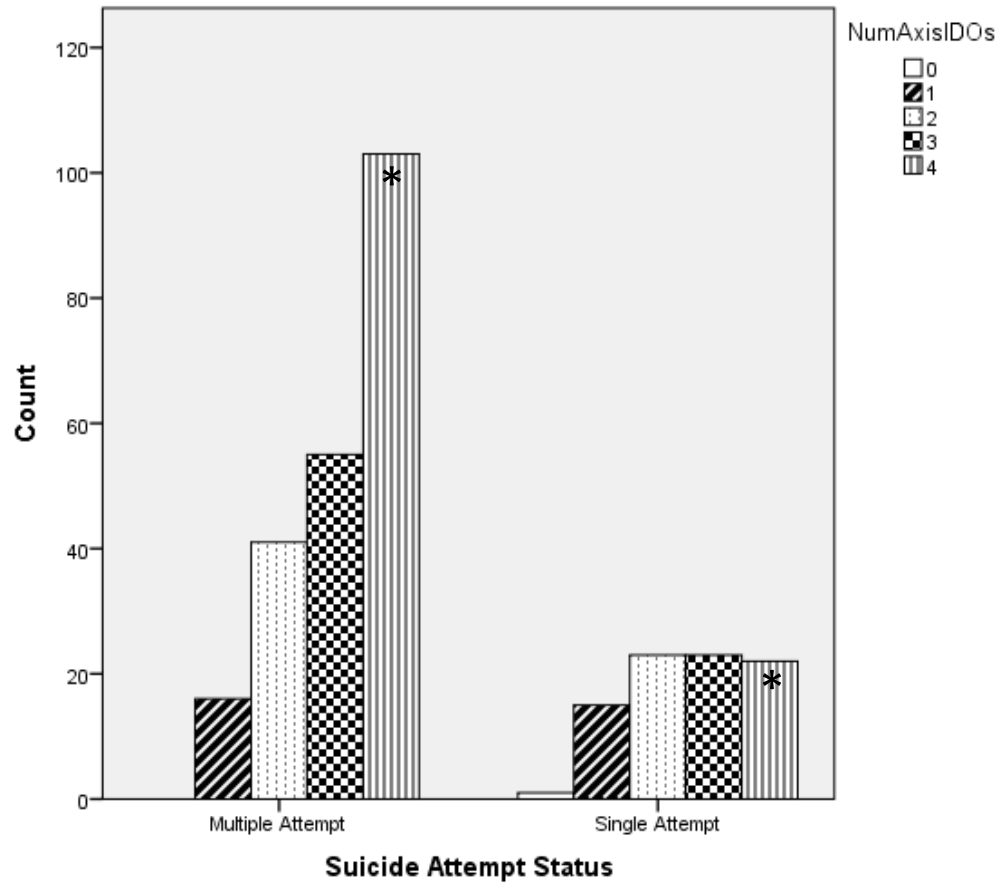


Figure 4. Frequency Counts of Number of Baseline Axis I Disorders in Individuals with a Single Suicide Attempt ($n = 84$) and Multiple Suicide Attempt ($n = 215$). Chi-square analyses $\chi^2(4) = 17.72$, $p = .001$; * indicates $p < .05$.

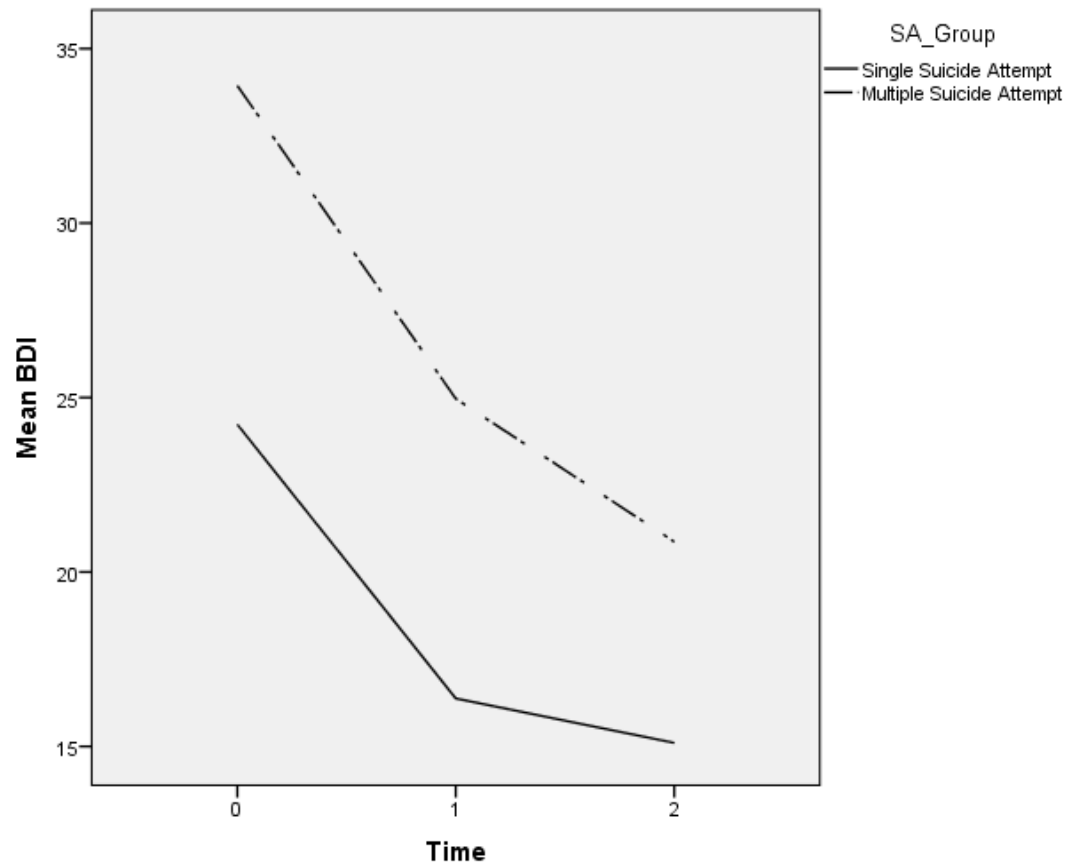


Figure 5. Mean BDI-II Scores over Time in Individuals with a Single Suicide Attempt ($n = 45$) and Multiple Suicide Attempt ($n = 104$).

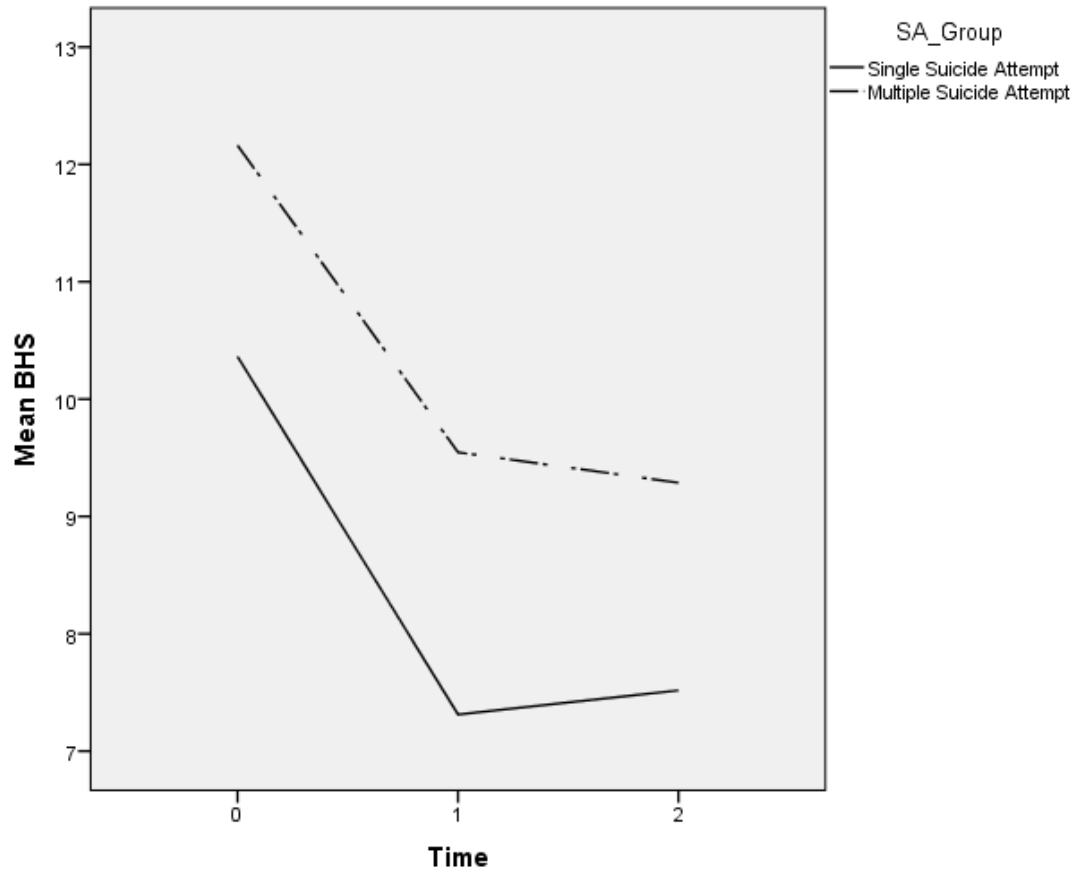


Figure 6. Mean BHS Scores over Time in Individuals with a Single Suicide Attempt ($n = 45$) and Multiple Suicide Attempt ($n = 104$).

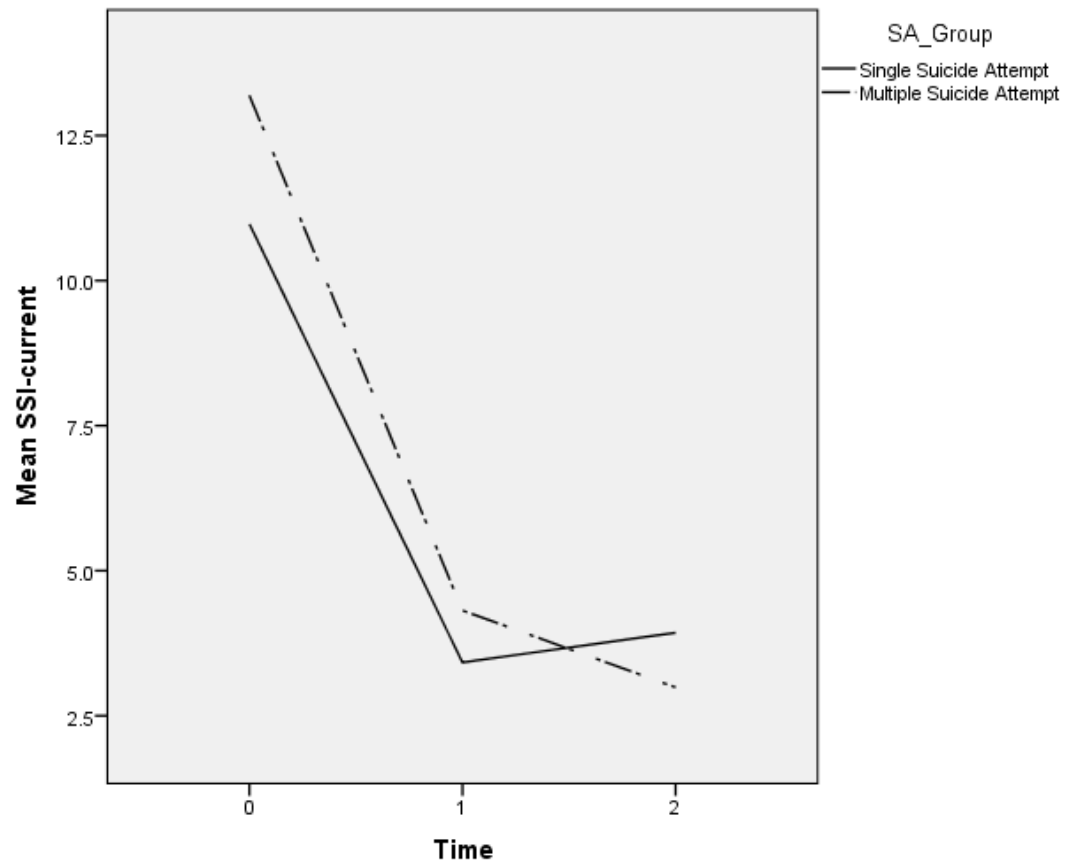


Figure 7. Mean SSI-current Scores over Time in Individuals with a Single Suicide Attempt ($n = 45$) and Multiple Suicide Attempt ($n = 104$).

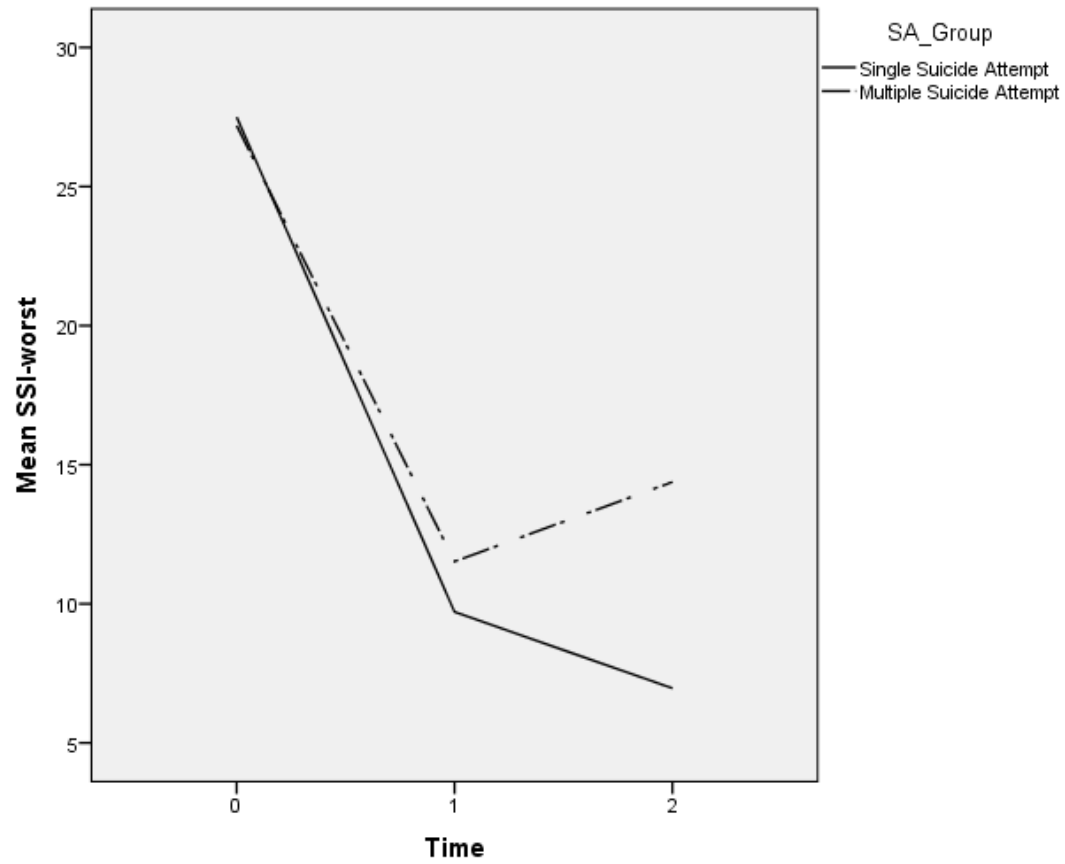


Figure 8. Mean SSI-*worst* Scores over Time in Individuals with a Single Suicide Attempt ($n = 45$) and Multiple Suicide Attempt ($n = 104$).

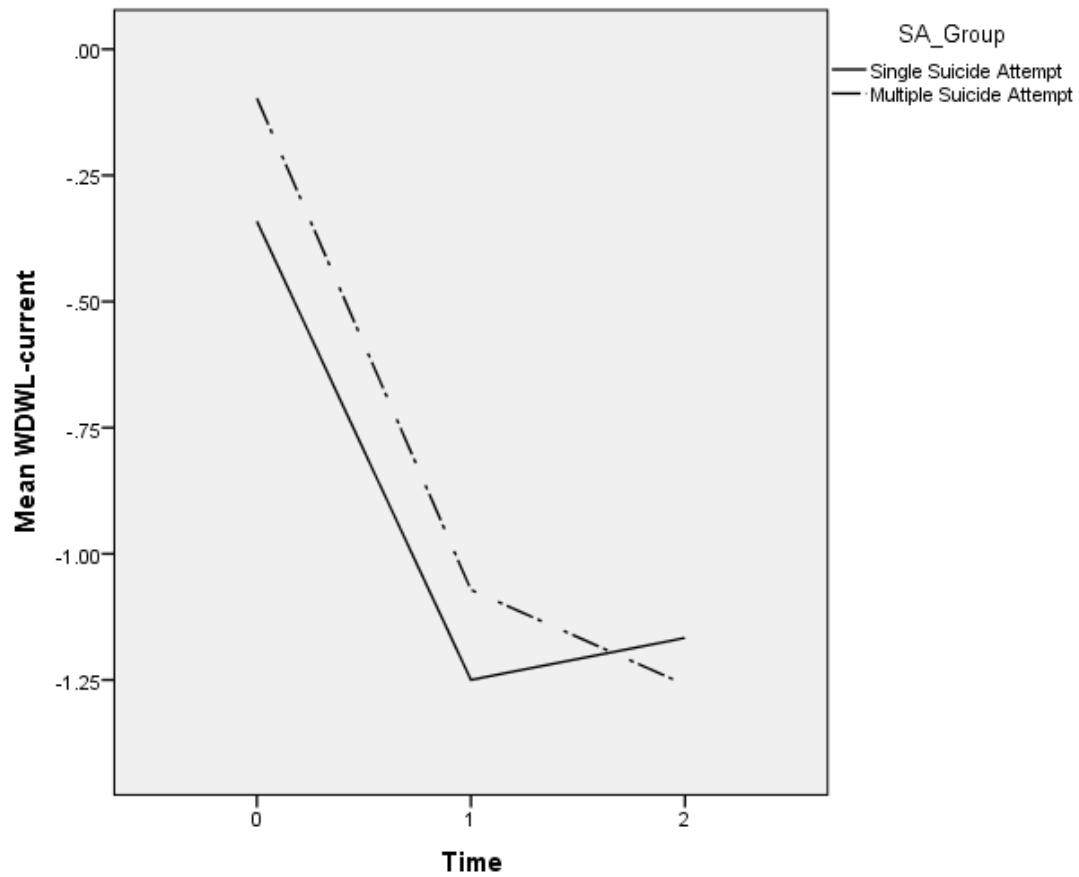


Figure 9. Mean WDWL-current Scores over Time in Individuals with a Single Suicide Attempt ($n = 45$) and Multiple Suicide Attempt ($n = 104$).

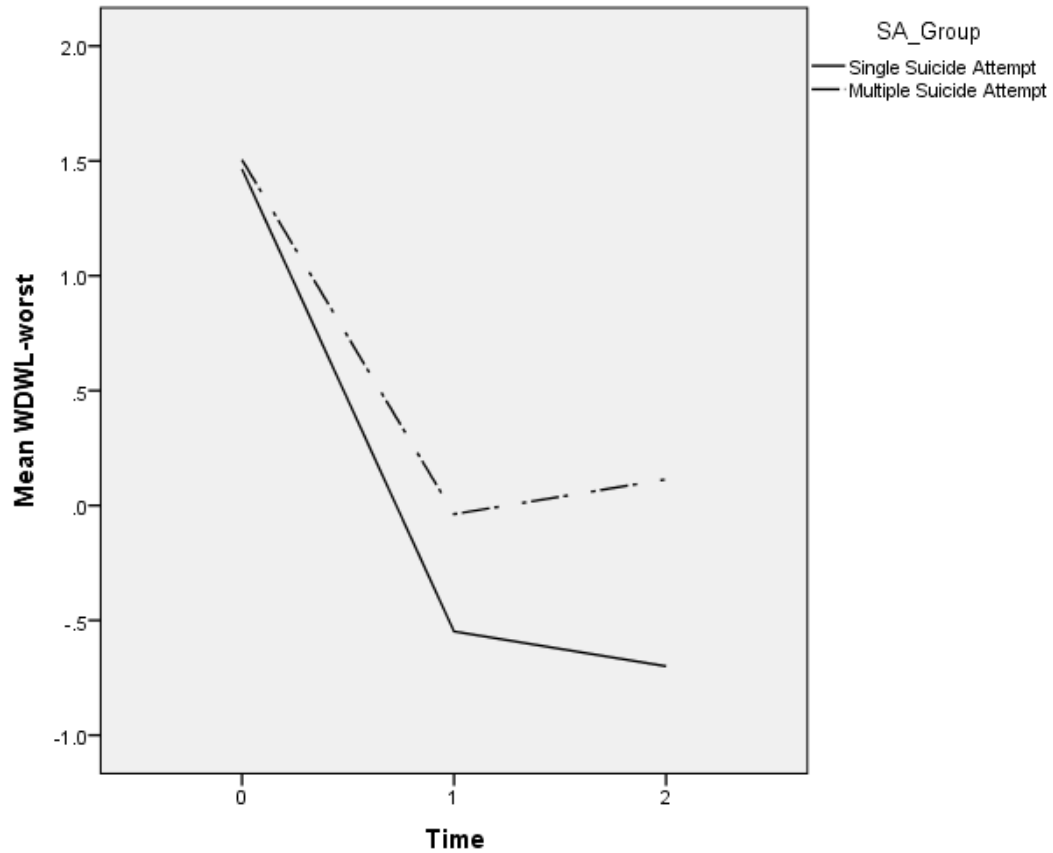


Figure 10. Mean WDWL-worst Scores over Time in Individuals with a Single Suicide Attempt ($n = 45$) and Multiple Suicide Attempt ($n = 104$).

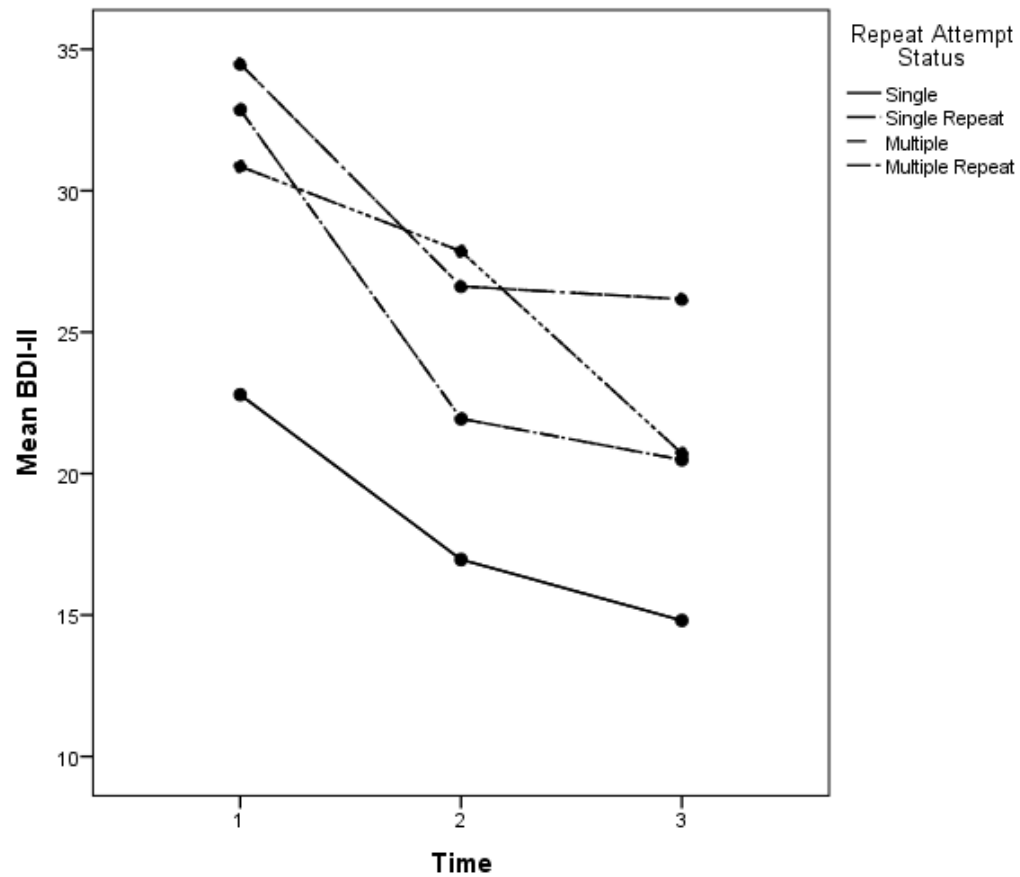


Figure 11. Estimated Marginal Mean BDI-II Scores over Time in Individuals with a Repeat Suicide Attempt ($n = 7$) and No Repeat Suicide Attempt ($n = 52$).

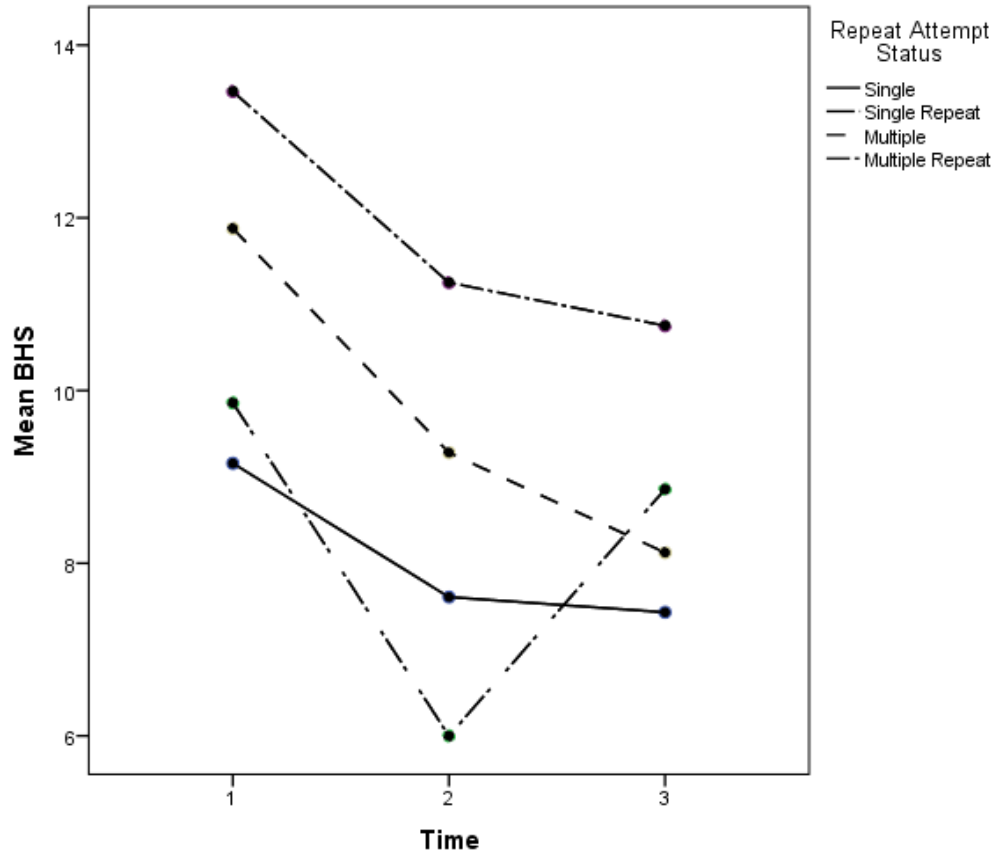


Figure 12. Estimated Marginal Mean BHS Scores over Time in Individuals with a Repeat Suicide Attempt ($n = 7$) and No Repeat Suicide Attempt ($n = 51$).

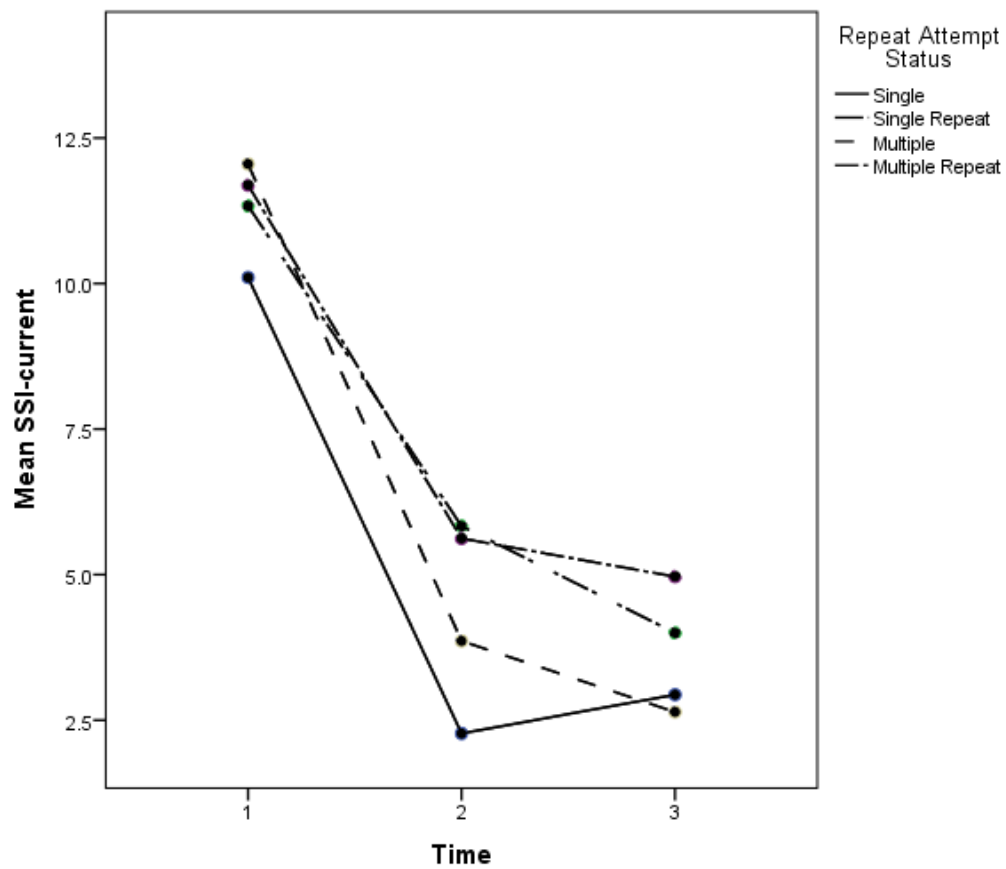


Figure 13. Estimated Marginal Mean SSI-current Scores over Time in Individuals with a Repeat Suicide Attempt ($n = 6$) and No Repeat Suicide Attempt ($n = 48$).

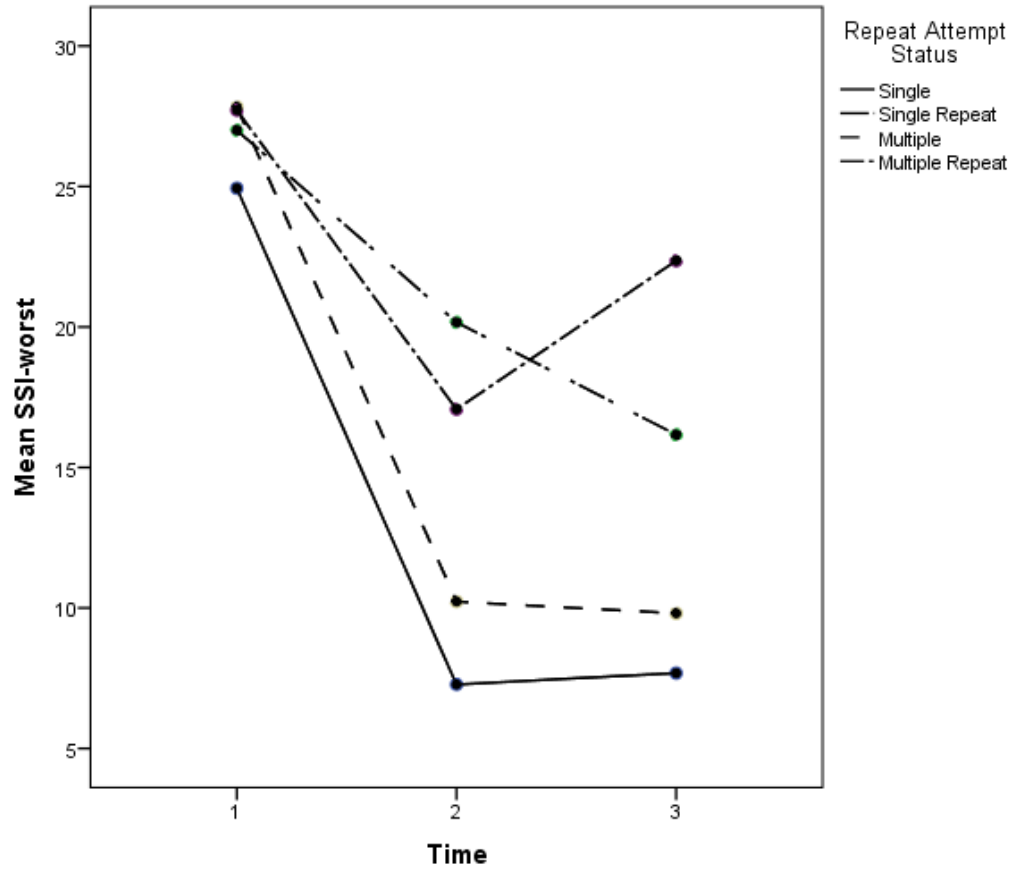


Figure 14. Estimated Marginal Mean SSI-worst Scores over Time in Individuals with a Repeat Suicide Attempt ($n = 6$) and No Repeat Suicide Attempt ($n = 47$).

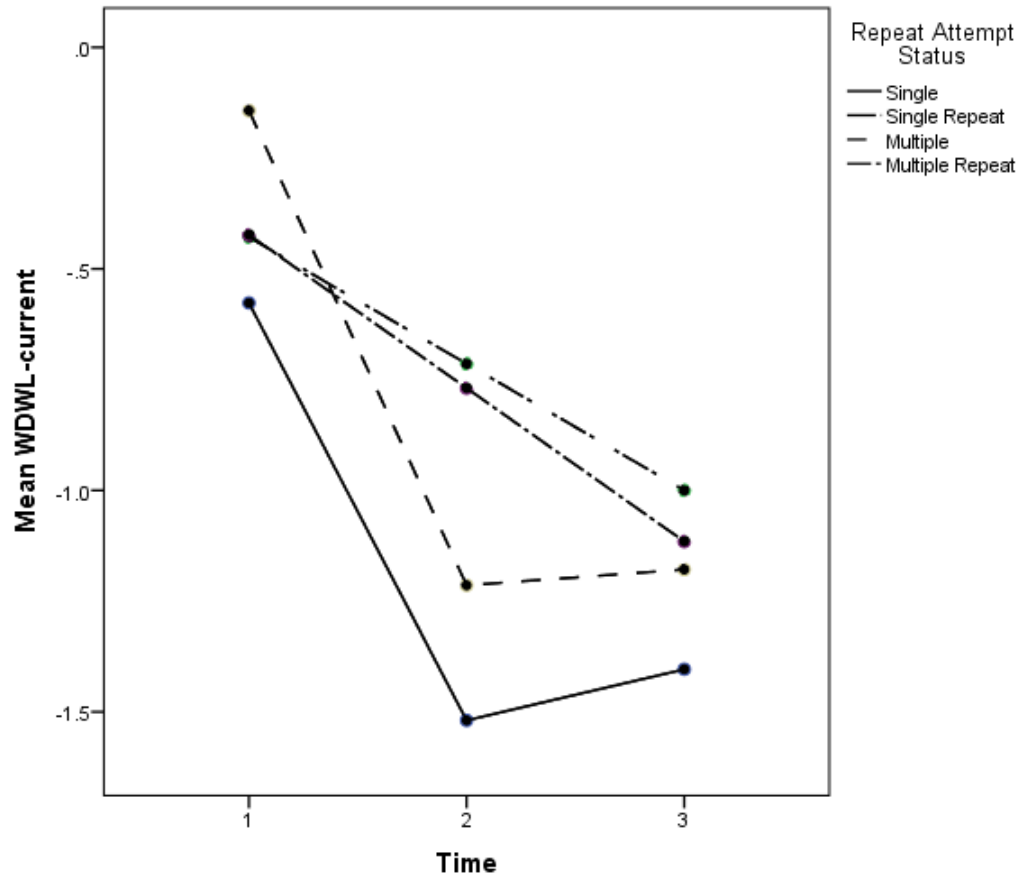


Figure 15. Estimated Marginal Mean WDWL-current Scores over Time in Individuals with a Repeat Suicide Attempt ($n = 7$) and No Repeat Suicide Attempt ($n = 52$).

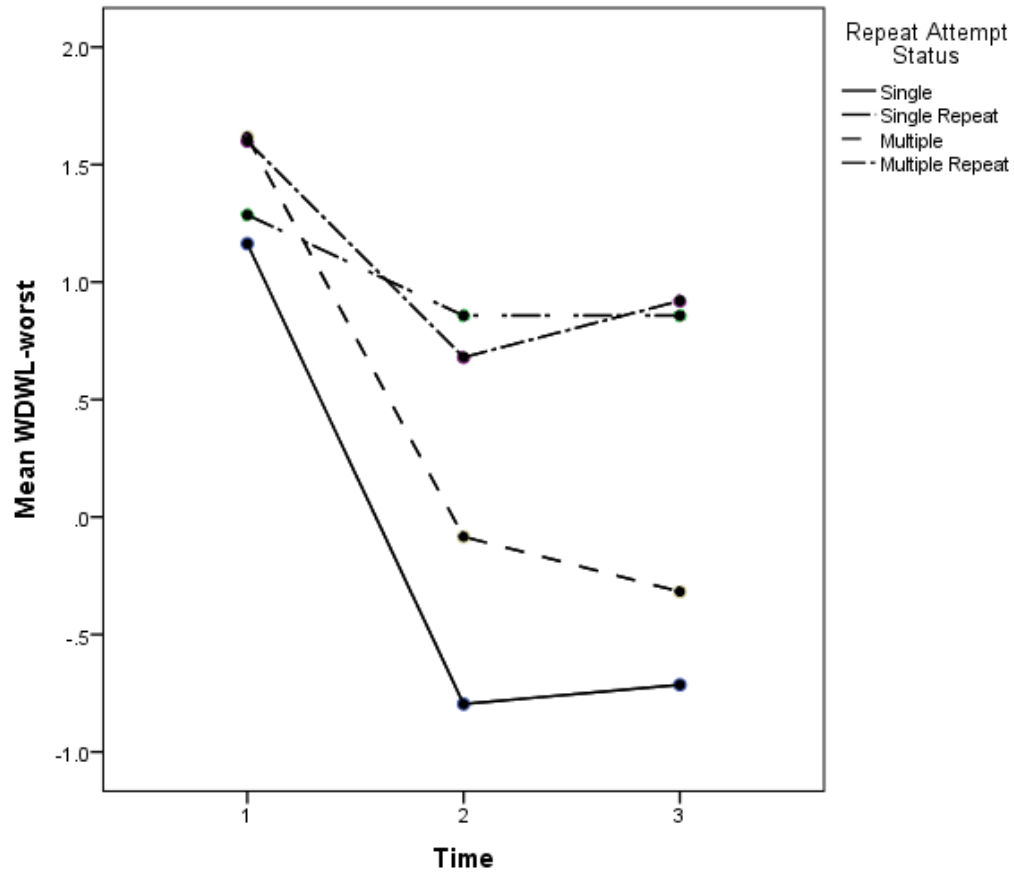


Figure 16. Estimated Marginal Mean WDWL-worst Scores over Time in Individuals with a Repeat Suicide Attempt ($n = 7$) and No Repeat Suicide Attempt ($n = 49$).

Appendix A

Locator and Demographic Forms

Study ID

Date (mm / dd / yy)

Contact Information

Name

How would you
like to be
addressed?

Address

Street

City /
State /
Zip

Phone Number

Home Phone

Cell Phone

Social Security
Number

Mail Contact

What is the best mailing address to contact
you over the next three months? Write
"same" if it's the same as Address.Who lives at the
above address?

Phone Contact

What is the best
phone number to
contact you over
the next 3
months?Whose phone
number is this?What is the best
day/time to call?

Is it ok to leave a voicemail

☐ Yes☐ NoIs it ok to leave a message with someone
else at this phone number?☐ Yes☐ No

E-mail Contact

What is your e-mail address?

Alternate email address

How often do you generally
check your e-mail messages?

1. Parent or next of kin contact information:

Name

Relationship

Address
(street, apt. #,
city/state, zip)

Phone

2. Parent or next of kin contact information:

Name

Relationship

Address
(street, apt. #,
city/state, zip)

Phone

Any other places I could call and leave a message or send a letter?

Demographic Information

1. What country were you born in?

☐ United States

☐ Other

If other--Which country?

2. Age

3. Sex

☐ Male

☐ Female

4. What is your Race/Ethnicity (check all that apply)?

☐ American Indian or Alaska Native

☐ Hispanic or Latino

☐ Other

☐ Asian

☐ Native Hawaiian or Other Pacific Islander

☐ Black or African American

☐ White

Please specify if you chose "Other"

5. What is your religious affiliation?

☐ Protestant

☐ Hindu

☐ Orthodox

☐ Agnostic

☐ Catholic

☐ Buddhist

☐ Unitarian

☐ Atheist

☐ Judaism

☐ Latter Day Saint

☐ New Age

☐ Other

☐ Muslim

☐ Jehovah's Witness

☐ Unaffiliated

Please specify if you chose "Other"

6. Is there a denomination of the above religion with which you identify?

☐ Yes

☐ No

If yes, what is that denomination?

7. How frequently do you attend religious community meetings (e.g., services, prayer meetings)?

☐ One or more times per week

☐ One or more times per year

☐ One or more times per month

☐ Less than once per year

☐ N/A

8. Your Education Level (Please mark highest level completed):

☐ Less than 9th grade

☐ Some College, No Degree

☐ 9th-12th grade, no diploma

☐ Associate Degree

☐ High School diploma or Equivalent

☐ Bachelor's Degree

☐ Graduate or Professional Degree

9. Annual Household Income

☐ Less than \$10,000

☐ \$75,000 - \$99,999

☐ \$10,000 - \$14,999

☐ \$100,000 - \$149,999

☐ \$15,000 - \$24,999

☐ \$150,000 - 199,999

☐ \$25,000 - \$34,999

☐ \$35,000 - \$49,999

☐ \$200,000 or more

☐ \$50,000 - \$74,999

10. Marital Status

- ☐ Never Married
☐ Married - 1st marriage
☐ Married - 2nd marriage
☐ Married - 3rd+ marriage
☐ Separated
☐ Cohabiting/Unmarried Partner
☐ Divorced (please indicate years below)
☐ Widowed (please indicate years below)

If you chose "Divorced" or
"Widowed," please indicate how
many years

11. Employment Status (check all that apply)

- ☐ Employed: Military Occupation - Full Time/Active Duty
☐ Employment: Military Occupation - Reserves
☐ Employed Full-Time (non-military occupation)
☐ Employed Part-Time (non-military occupation)
☐ Not Employed Outside the Home
☐ Unemployed
☐ Student

QUESTIONS 12-14 CIVILIAN ONLY (Military skip to Question 15 below):

12. Have you served in the military?

- ☐ Yes ☐ No

If yes...

Branch of Military
Service

Number of
Years/Months of
Military Service:

Rank at Separation

Did you deploy?
(yes/no)

--If yes: Where and
how long were
your deployments

13. Sponsor's Branch of Service

14. Sponsor's Relationship to You

MILITARY SERVICE INFORMATION

Please answer questions 15 through 20 only if you are **currently** a military service member.

15. Branch of Military Service

- | | | | |
|---|--|--|---|
| <input type="checkbox"/> Army
Active Duty | <input type="checkbox"/> Air Force
Active Duty | <input type="checkbox"/> Navy
Active Duty | <input type="checkbox"/> Marine Corps
Reserves |
| <input type="checkbox"/> Army
Reserves | <input type="checkbox"/> Air Force
Reserves | <input type="checkbox"/> Naval
Reserves | <input type="checkbox"/> Coast Guard
Active Duty |
| <input type="checkbox"/> Army
National Guard | <input type="checkbox"/> Air Force
National Guard | <input type="checkbox"/> Marine Corps
Active Duty | <input type="checkbox"/> Coast Guard
Reserves |

16. Number of
Years/Months of Military
Service:

17. Total Number of
Career Deployments

19. Pay Grade/Rank

<input type="checkbox"/> E-1	<input type="checkbox"/> E-7	<input type="checkbox"/> W-4	<input type="checkbox"/> O-5
<input type="checkbox"/> E-2	<input type="checkbox"/> E-8	<input type="checkbox"/> W-5	<input type="checkbox"/> O-6
<input type="checkbox"/> E-3	<input type="checkbox"/> E-9	<input type="checkbox"/> O-1	<input type="checkbox"/> O-7
<input type="checkbox"/> E-4	<input type="checkbox"/> W-1	<input type="checkbox"/> O-2	<input type="checkbox"/> O-8
<input type="checkbox"/> E-5	<input type="checkbox"/> W-2	<input type="checkbox"/> O-3	<input type="checkbox"/> O-9
<input type="checkbox"/> E-6	<input type="checkbox"/> W-3	<input type="checkbox"/> O-4	<input type="checkbox"/> O-10

18. Training Status

- ☐ In Basic Training At Time of Hospital Admission
- ☐ In Specialization Training At Time of Hospital Admission
- ☐ Post-Training At Time of Hospital Admission (Active Duty)

20. Deployment History (Please record information of your deployments; please use back of paper if needed to record additional deployment information)

1st Deployment

Combat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

2nd Deployment

Combat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

3rd Deployment

Combat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

4th Deployment

Combat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

5th DeploymentCombat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

6th DeploymentCombat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

7th DeploymentCombat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

8th DeploymentCombat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

9th DeploymentCombat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

10th**Deployment**Combat? ☐ Yes ☐ No

Location:

From (month/year):

To (month/year):

Appendix B

Date : <div style="display: flex; justify-content: center; gap: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	ASAP	Mode: <input type="checkbox"/> Self-Report <input type="checkbox"/> Face-to-Face Interview <input type="checkbox"/> Telephone Interview
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Personal Data

INSTRUCTIONS: Please fill in the items for name, the date, etc. Print in block capitals and keep your printing inside the marks at all times. If you do not know how to fill in something, leave it blank and ask a staff member for help.

First Name: <div style="border: 1px solid black; display: inline-block; width: 150px; height: 20px;"></div> Last Name: <div style="border: 1px solid black; display: inline-block; width: 150px; height: 20px;"></div> Social Security # <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> Age: <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> What country were you born in? <input type="checkbox"/> United States - which state? <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> DOB <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> / <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> / <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> <input type="checkbox"/> Other - Country <div style="border: 1px solid black; display: inline-block; width: 100px; height: 20px;"></div>	Middle Initial <div style="border: 1px solid black; display: inline-block; width: 30px; height: 20px;"></div> Sex: <input type="checkbox"/> M <input type="checkbox"/> F <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> What is your Race/Ethnicity? <input type="checkbox"/> American Indian <input type="checkbox"/> Hispanic <input type="checkbox"/> Asian <input type="checkbox"/> White <input type="checkbox"/> African American <input type="checkbox"/> Other </div>
Home Street Address: <div style="border: 1px solid black; display: inline-block; width: 200px; height: 20px;"></div> City: <div style="border: 1px solid black; display: inline-block; width: 100px; height: 20px;"></div> Zip Code: <div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div> State: <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> Home Phone: <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> What is your marital status? <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Separated <input type="checkbox"/> Never Married <input type="checkbox"/> Widowed </div>
<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> May we call you at home if necessary? <input type="checkbox"/> Yes <input type="checkbox"/> No </div>	
<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Your employment status: <input type="checkbox"/> Full-time student <input type="checkbox"/> Unemployed <input type="checkbox"/> Part-time employed <input type="checkbox"/> Disabled <input type="checkbox"/> Full-time employed <input type="checkbox"/> Retired <input type="checkbox"/> Full-time homemaker <input type="checkbox"/> Other </div>	
Occupation: <div style="border: 1px solid black; display: inline-block; width: 150px; height: 20px;"></div>	Spouse's Occupation: <div style="border: 1px solid black; display: inline-block; width: 150px; height: 20px;"></div>
Business Street Address: <div style="border: 1px solid black; display: inline-block; width: 200px; height: 20px;"></div> City: <div style="border: 1px solid black; display: inline-block; width: 100px; height: 20px;"></div> Zip Code: <div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div> State: <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> Work Phone: <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> Beeper #: <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div> - <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	
<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> May we call you at work if necessary? <input type="checkbox"/> Yes <input type="checkbox"/> No </div>	

ASAP Personal Data Form

Your Education Level (mark highest level completed):

☐ 6th grade ☐ 7th to 11th grade ☐ High School ☐ Some College ☐ College Degree ☐ Graduate School

Number of Children or Dependents:

Please List below:

1. Full Name:

Age:

Sex:

☐ M ☐ F

Living with you?

☐ yes ☐ no

2. Full Name:

Age:

Sex:

☐ M ☐ F

Living with you?

☐ yes ☐ no

3. Full Name:

Age:

Sex:

☐ M ☐ F

Living with you?

☐ yes ☐ no

4. Full Name:

Age:

Sex:

☐ M ☐ F

Living with you?

☐ yes ☐ no

It will be important for us to be able to contact you in the future for the follow-up assessments. Please list three people who we could contact and who would likely know how we might be able to reach you if you have moved or have changed your number.

1. First Name:

Last Name:

Street Address:

Phone:

 - -

City:

Zip Code:

State:

Relation

☐ spouse ☐ child
☐ parent ☐ friend
☐ sibling ☐ other

2. First Name:

Last Name:

Street Address:

Phone:

 - -

City:

Zip Code:

State:

Relation

☐ spouse ☐ child
☐ parent ☐ friend
☐ sibling ☐ other

3. First Name:

Last Name:

Street Address:

Phone:

 - -

City:

Zip Code:

State:

Relation

☐ spouse ☐ child
☐ parent ☐ friend
☐ sibling ☐ other

Appendix C

Date : <div style="display: flex; align-items: center; gap: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> / <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> / <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> </div>	<h1 style="margin: 0;">ASAP 3</h1>	Mode: <input type="checkbox"/> Self-Report <input type="checkbox"/> Face-to-Face Interview <input type="checkbox"/> Telephone Interview
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Alcohol Screen

Please read:

Now I would like to ask you about your use of alcoholic beverages, like beer, wine, wine coolers or hard liquor like vodka, gin or whiskey.

- | | |
|---|--|
| 1. Have you ever had a drink of alcohol? If no, stop. | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 2. If yes, how about in the last year? If no, skip to 4. | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 3. During the past week, did you drink any alcoholic beverages? | <input type="checkbox"/> yes <input type="checkbox"/> no |

3a. (if yes) I would like to know the number of alcoholic drinks you have had in the past week.
 Today is _____. Let's begin with yesterday.

How many drinks of (beer, wine, liquor) did you have on (NAME DAY OF WEEK)?

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
Number of drinks	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>

NOTE: A single mixed drink = 1 drink A fifth of hard liquor = 18 drinks
 A 12 oz beer = 1 drink A 5 oz glass of wine = 1 drink
 A shot of hard liquor = 1 drink A pint of wine = 4 drinks
 A pint of hard liquor = 11 drinks A 40 oz bottle of wine = 8 drinks

- | | |
|--|--|
| 4. Have you ever had more than 5 or more drinks in one day?
If no, STOP. | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 5. During the last three months, on days that you drank alcohol, how many times did you drink 5 or more drinks in one day?
<input type="checkbox"/> None <input type="checkbox"/> 1 time <input type="checkbox"/> 2-4 times <input type="checkbox"/> 5-10 times <input type="checkbox"/> more than 10 times | |
| 6. Has alcohol ever caused problems for you? | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 7. Has anyone ever told you that alcohol has caused problems for you or complained about your drinking? | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 8. Has your use of alcohol ever caused a relationship problem with anyone? | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 9. Has your use of alcohol ever caused any problems at work or performing other responsibilities? | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 10. Has your use of alcohol ever caused any legal problems such as an arrest or DUI? | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 11. Have you ever attended a 12 step meeting such as AA, NA, Al-Anon or ACOA? | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 12. Have you ever been in an alcohol rehabilitation program?
If Yes, when and where did you receive such treatment?_____ | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 13. Have you ever been hospitalized because of an alcohol problem?
If Yes, when and where were you hospitalized?_____ | <input type="checkbox"/> yes <input type="checkbox"/> no |

Appendix D

Date : <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px; margin: 2px;"></div> / <div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px; margin: 2px;"></div> / <div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px; margin: 2px;"></div>	<h1 style="margin: 0;">A S A P</h1>	Mode: <input type="checkbox"/> Self-Report <input type="checkbox"/> Face-to-Face Interview <input type="checkbox"/> Telephone Interview
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DRUG SCREEN

1. Have you ever used any street drugs, such as cocaine, marijuana, speed or LSD? ☐ yes ☐ no
 If No, STOP.
2. If yes, which of the following have you used in your life time:

<input type="checkbox"/> Marijuana	<input type="checkbox"/> PCP (angel dust)	<input type="checkbox"/> Downers (e.g., qualudes, Valium)
<input type="checkbox"/> Cocaine	<input type="checkbox"/> Heroin	<input type="checkbox"/> Uppers (e.g., speed, crystal meth)
<input type="checkbox"/> Other _____		<input type="checkbox"/> Hallucinogens (e.g., LSD)
3. Which of the following have you used more than 10 times in a 30 day period?:

<input type="checkbox"/> Marijuana	<input type="checkbox"/> PCP (angel dust)	<input type="checkbox"/> Downers (e.g., qualudes, Valium)
<input type="checkbox"/> Cocaine	<input type="checkbox"/> Heroin	<input type="checkbox"/> Uppers (e.g., speed, crystal meth)
<input type="checkbox"/> Other _____		<input type="checkbox"/> Hallucinogens (e.g., LSD)
4. Which of the following have you used in the past 30 days?: If none, go to 6.

<input type="checkbox"/> Marijuana	<input type="checkbox"/> PCP (angel dust)	<input type="checkbox"/> Downers (e.g., qualudes, Valium)
<input type="checkbox"/> Cocaine	<input type="checkbox"/> Heroin	<input type="checkbox"/> Uppers (e.g., speed, crystal meth)
<input type="checkbox"/> Other _____		<input type="checkbox"/> Hallucinogens (e.g., LSD)
5. For each drug used in the past 30 days, list it and ask how many times it was used in that period.

<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div>	<input type="checkbox"/> 1	<input type="checkbox"/> 2-4	<input type="checkbox"/> 5-10	<input type="checkbox"/> 11-15	<input type="checkbox"/> more than 15
<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div>	<input type="checkbox"/> 1	<input type="checkbox"/> 2-4	<input type="checkbox"/> 5-10	<input type="checkbox"/> 11-15	<input type="checkbox"/> more than 15
<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div>	<input type="checkbox"/> 1	<input type="checkbox"/> 2-4	<input type="checkbox"/> 5-10	<input type="checkbox"/> 11-15	<input type="checkbox"/> more than 15

6. Has anyone ever told you that drugs have caused a problem for you or complained about your drug use?	<input type="checkbox"/> yes <input type="checkbox"/> no
7. Has your use of drugs ever caused a relationship problem with anyone?	<input type="checkbox"/> yes <input type="checkbox"/> no
8. Has your use of drugs ever caused any problems at work or other responsibilities?	<input type="checkbox"/> yes <input type="checkbox"/> no
9. Have drugs ever caused any physical problems such as headaches, shakiness, stomach aches, seizures, or liver damage?	<input type="checkbox"/> yes <input type="checkbox"/> no
10. Has your use of drugs ever caused any psychological problems such as feeling depressed?	<input type="checkbox"/> yes <input type="checkbox"/> no
11. Has your use of drugs ever caused any legal problems such as being arrested or DUI?	<input type="checkbox"/> yes <input type="checkbox"/> no
12. Have you ever been hospitalized or to a detoxification program because of drug use? If Yes, when and where did you receive such treatment? _____	<input type="checkbox"/> yes <input type="checkbox"/> no
13. Have you ever gotten "hooked" on a prescribed medication or taken a lot more of it than you were supposed to? If Yes, please list those medications: _____	<input type="checkbox"/> yes <input type="checkbox"/> no

2/16/2000
ASAP.DSCSRN

Patient ID
Bar Code:

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2309256580

Appendix E

Visit:		A S A P	Mode:	
<input type="checkbox"/> Intake	<input type="checkbox"/> Term	<input type="checkbox"/> Self-Report		
<input type="checkbox"/> 1	<input type="checkbox"/> 12	<input type="checkbox"/> Face-to-Face Interview		
<input type="checkbox"/> 3	<input type="checkbox"/> 18	<input type="checkbox"/> Telephone Interview		
<input type="checkbox"/> 6	<input type="checkbox"/> 24	Date :		
<div style="border: 1px solid black; display: inline-block; width: 30px; height: 20px;"></div> / <div style="border: 1px solid black; display: inline-block; width: 30px; height: 20px;"></div> / <div style="border: 1px solid black; display: inline-block; width: 30px; height: 20px;"></div>				

DSM -IV BORDERLINE PERSONALITY DISORDER DEFINITION

A pervasive pattern of instability in interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the following:

1. You've said that you have [Have you] often become frantic when you thought that someone you really cared about was going to leave you. What have you done? (Have you threatened or pleaded with him/her?)	(1) frantic efforts to avoid real or imagined abandonment [DO NOT INCLUDE SUICIDAL OR SELF-MUTILATING BEHAVIOR COVERED IN (5).]	112 <input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
3=several examples		

2. You've said that [Do] your relationships with people you really care about have lots of extreme ups and downs. Tell me about them. (Were there times when you thought they were everything you wanted and then other times when you thought they were terrible? How many relationships were like this?)	(2) a pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation	113 <input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
3=either one prolonged relationship or several briefer relationships in which the alternating pattern occurs at least twice		

3. You've said that you have [Have you] all of a sudden changed your sense of who you are and where you are headed. Give me some examples of this.	(3) identity disturbance: markedly and persistently unstable self-image or sense of self	114 <input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
---	---	---

4. You've said that your [Does your] sense of who you are often changes dramatically. Tell me more about that.	3=acknowledges trait
---	----------------------

1/10/2000
ASAP.BRDSCREEN

Patient ID
Bar Code:

Page 1 of 3
9102280642

ASAP**Borderline Screening Form**

5. You've said that you are [Are you]
different with different people or in
different situations so that you sometimes
don't know who you really are.

Give me some examples of this.
(Do you feel this way a lot?)

6. You've said that there have been
[Have there been] lots of
sudden changes in your goals,
career plans, religious beliefs, and so on.

Tell me more about that.

7. You've said that you've [Have you] often done things impulsively	(4) impulsivity in at least two areas that are potentially self-damaging (e.g., spending, sex, substance abuse, reckless driving, binge eating) [DO NOT INCLUDE SUICIDAL OR SELF-MUTILATING BEHAVIOR COVERED IN (5).]	115 <input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
What kinds of things? (How about... ... buying things you really couldn't afford? ... having sex with people you hardly knew, or "unsafe sex"? ... drinking too much or taking drugs? ... driving recklessly? ... uncontrollable eating?	3=several examples indicating a pattern of impulsive behavior (not necessarily limited to examples above)	
IF YES TO ANY OF ABOVE: Tell me about that: How often? What kinds of problems?.		

8. You've said that you have [Have you] tried to hurt or kill yourself or threatened to do so.	(5) recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior 3=two or more events (when not in a Major Depressive Episode)	116 <input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
9. You've said that you have [Have you ever] cut, burned, or scratched yourself on purpose.		
Tell me about that.		

ASAP**Borderline Screening Form**

10. You've said that [are you] a very moody person?	(6) affective instability due to a marked reactivity of mood (e.g., intense episodic dysphoria, irritability, or anxiety usually lasting a few hours and only rarely more than a few days)	117	<input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
Tell me about that.			
(How long do your "bad" moods last? How often do these mood changes happen? How suddenly do your moods change?)	3=acknowledges trait		
11. You've said that [Do] you often feel empty inside.	(7) chronic feelings of emptiness	1	<input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
Tell me more about this.	3=acknowledges trait		
12. You've said that [Do] you often have temper outbursts or get so angry that you lose control.	(8) inappropriate, intense anger or difficulty controlling anger (e.g., frequent displays of temper, constant anger, recurrent physical fights)	1	<input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
Tell me more about this.			
13. You've said that [Do] you hit people or throw things when you get angry.			
14. You've said that [Do] even little things get you very angry.			
When does this happen?	3=acknowledges trait and at least one example or several examples		
(Does this happen often?)			
15. You've said that when you are under a lot of stress, you [When you are under a lot of stress, do you] get suspicious of other people or feel especially spaced out.	(9) transient, stress-related paranoid ideation or severe dissociative symptoms	120	<input type="checkbox"/> ? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
Tell me about that.	3=several examples that do not occur exclusively during a Psychotic Disorder or a Mood Disorder with Psychotic Features		

AT LEAST FIVE ITEMS ARE CODED "3"

121

☐ 1☐ 3

BPD

